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THE CIENFUEGOS NUCLEAR PLANT IN CUBA

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The Cienfuegos Nuclear Plant in Cub...

HEARING
BEFORE THE
SUBCOMMITTEE ON
THE WESTERN HEMISPHERE
OF THE
COMMITTEE ON
INTERNATIONAL RELATIONS
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTH CONGRESS
SECOND SESSION

AUGUST 1, 1995

Printed for the use of the Committee on International Relations

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THE CIENFUEGOS NUCLEAR PLANT IN CUBA

TUESDAY, AUGUST 1, 1995

House of Representatives,
Subcommittee on the Western Hemisphere,
Committee on International Relations,
Washington, DC.

The subcommittee met, pursuant to notice, at 3:04 p.m., in room 2172, Rayburn House Office Building, Honorable Dan Burton, chairman presiding.

Mr. Burton. I want to welcome everybody here today. We are here to obtain testimony on a matter of vital national security interest to the United States of America. The dormant nuclear power plant of Juragua, near Cienfuegos in Cuba, is apparently going to be completed after sitting idle and uncompleted since the collapse of the Soviet Union.

There are major safety and security concerns surrounding this plant. Several defectors who were employed at the plant have stated that they are aware of serious structural flaws.

The GAO has recently updated a study of the Juragua plant, and their conclusions raise the specter of a major disaster there that could very well impact on the health and the very lives of millions of Americans and people in Mexico, Central America, and throughout the Caribbean. This is a national security threat of the first order. We fully intend to expose the facts of this very critical matter during today's hearing.

The Fidel Castro dictatorship is on its last leg. The economy of Cuba has contracted by over 60 percent since the collapse of the Soviet Union. Castro is desperate for hard currency to prop up his regime. He is also desperate to alleviate the very severe energy crisis which currently grips Cuba.

Fidel Castro has proved over and over again that he has no regard whatsoever for the lives and welfare of his own people. It stands to reason that he has even less regard for the lives and welfare of other people throughout this hemisphere.

For evidence of Castro's blatant disregard for human life, as if any were needed, just ask the former political prisoners such as Armando Valladares, who bravely suffered for decades in Castro's gulags. Or ask the families of the many victims murdered over the years by the Castro dictatorship, such as the people who were on the March 13 tugboat last year.

The desperate financial straits in which Castro finds himself today only increases his willingness to sacrifice the safety and well-being of the citizens of Cuba, the United States, and other countries in this hemisphere. A nuclear disaster in Cuba would imperil the lives not only of the people of Cuba, but also millions in the southeastern part of the United States, and Mexico, and Central America, and elsewhere in the hemisphere. We must remain determined to see to it that no unsafe nuclear facilities are allowed to be completed.

We must ask the following questions: What is the status of the nuclear reactor? What are the structural defects of the nuclear reactor? Who is involved in the plans for the completion of the reactor? What is the likelihood of a Chernobyl style disaster? What would be the effects of such a disaster? Is there any potential for the facilities to be used for building nuclear weapons, and are there any plans to do so? What is the Clinton administration intending to do about the reactor?

We have a very distinguished panel of witnesses today, and we look forward to hearing their testimony. I would only ask that they keep their statements as short as possible, and that the questions and answers also be kept short, as we have a tremendous amount of ground to cover.

We will have the witnesses under the 5-minute rule. If they have statements longer than that, I hope that they will ask to have those submitted for the record.

And with that, let me recognize my colleague from Florida, Ms. Ileana Ros-Lehtinen.

Ms. ROS-LEHTINEN. Thank you, Mr. Chairman.

Today our subcommittee holds what is definitely one of the most pressing hearings of the year for the Western Hemisphere, because it deals with a grave security threat to the United States, the Juragua nuclear power plant in Cuba.

Mr. Chairman, the completion of this plant would represent the introduction of a real and present threat to the national security of the United States. Former technicians who worked at the plant, as well as experts on the issue, have stated the grave concerns about the deficient construction of the plant, and of the inferior materials used to build it.

These experts and technicians have detailed dangerous deficiencies in the plant's construction, which could lead to a nuclear accident, which will likely affect Central America, the Caribbean, the United States, and of course Cuba itself.

Among the most worrisome details which have emerged is the high percentage of pipe welding which x-ray tests have proven to be deficient, the lack of technical ability in Cuba to maintain such a plant, the lack of an infrastructure in Cuba to operate a nuclear facility, the low pressure threshold of the reactor's containment dome, and many other defects.

Some have expressed doubts about the credibility of the announcement made last May 14 when Russian officials announced the creation of a multinational consortium to finance the estimated $800 million to complete the two reactors which compose the Juragua nuclear plant.

In that announcement, various companies, Siemens of Germany, and Ansaldo of Italy, and Electricite de France, along with the Brazilian and British firms, were mentioned as being involved in the proposed project.

Indeed, just 2 weeks ago, press reports from Brazil indicated that a company from that country based in Rio de Janiero, MPE, had visited Russia to finalize the deal that will reinitiate construction of the nuclear plant.

Moreover, in the last few months, the state controlled media in Cuba has reiterated the intention of the Castro regime to complete the plant, and has in various instances mentioned Siemens of Germany as a firm which will provide Castro with much of the equipment to complete the plant, mainly the plant's control system.

So there is no doubt, Mr. Chairman, that Castro plans to complete this plant and finish it as soon as possible. The main motive for Castro to complete the plant is the same motive that drives him for much of what he does, his relentless pursuit to maintain absolute power over the island and its people. Juragua is part of Castro's plan to supplant nuclear power for oil, as the regime's main source of energy. Juragua will offer this energy to the tourism industry, which is the principal way through which Castro receives foreign exchange to maintain his regime.

So once again, the Cuban people's lives will be put at risk and sacrificed in order to satisfy the ego and the desire for total power of Castro and his communist associates.

A troublesome phenomena that has once again emerged from the Juragua issue is the silence which the Clinton administration has kept on this issue. While the President's Cuban advisors are quick to issue threats against those in the exile community who fight for the liberation of Cuba, a loud silence can be heard from the White House on this critical and important issue to the national security of the United States.

This week, I received, along with many of our colleagues, a response from the President to a cosigned letter which 131 of our colleagues signed, including most members of this subcommittee, urging the President to take strong action to halt the completion of the Juragua plant. Unfortunately, the President's response was weak, and offered no clue of a strong commitment from the administration to effectively tackle this important issue.

Mr. Chairman, the message from the United States to Castro should be clear. The United States will not tolerate under any circumstances the operation of the Juragua nuclear plant in Cuba.

Sufficient evidence exists to believe with certainty that this plant if completed could be a national security threat to the United States. Thus, the only solution to the Juragua national nuclear plant problem is to destroy it in its totality.

Modifications are not enough for the defects that are hidden beneath mounds of concrete. Total elimination of the plant is the only solution. Unfortunately, this strong and stern message is not likely to emerge from the White House, because the Juragua nuclear plant and the threat that it poses to the United States is a magnificent obstacle on the reconciliation path that the administration is taking toward the Castro regime.

Mr. Chairman, the bottom line is that the United States cannot allow this plant to be completed. It should be made clear to Castro that a national security threat just 180 miles from our shores will not be tolerated.

The Juragua nuclear plant is a symbol of Castro's endless pursuit to maintain power and introduce new dangers to our hemisphere. It also serves as a measurement of the commitment of the administration to face up to the Cuban tyrant, and of its support to the Cuban people, and of its defenses of our U.S. national security.

And I thank the chairman for holding this most important hearing.

Mr. BURTON. I thank the gentlelady for her comments.

I recognize the Honorable Bob Menendez.

Mr. MENENDEZ. Thank you, Mr. Chairman.

I want to commend you for holding this hearing, given what I perceive to be, and others may disagree, but I perceive to be the urgency of the issue.

Two and a half years ago when I first came to the Congress and raised this issue, many people looked at me skeptically, and few people paid attention. But today we find ourselves with Russia and Cuba having announced the joint stock company to finish construction of the nuclear power plants under question on the southern coast of Cuba. Hence, what I perceive as the urgency, the seriousness of the matter.

It is interesting what television can do, Mr. Chairman. "Sixty Minutes" did a story on it, and suddenly everybody paid attention. But if that is the way that we need to get out the word, then that is good.

And I think that what we are going to do here today, Mr. Chairman, is an important aspect of giving people information both here in the Congress, and in the United States, and for that matter the rest of the hemisphere and the world. Because I think that they should be concerned as well.

Now in June, the House passed an amendment that I offered along with all of my colleagues here with your support, Mr. Chairman; Mr. Diaz-Balart, who helped it get through the Rules Committee; Mr. Deutsch; Ms. Ros-Lehtinen; and Mr. Torricelli, to reduce dollar for dollar U.S. aid to any country which financially helps the Castro dictatorship finish these dangerous nuclear plants.

And in July, our full committee in a bill that you are sponsoring, Mr. Chairman, the Libertad Act, also included a similar amendment.

So Congress has spoken clearly on the issue. Yet we see that the plans move ahead for building what is a dangerous and mothballed Soviet-era nuclear power plant in Juragua near Cienfuegos. And it is of great concern.

Let me say in defense of the President, who I have great disagreements with of late as it relates to his foreign policy vis-a-vis Cuba, that in fact in April 1993 in response to my concerns about this when others were not listening, he said in an answer to my letter, "The United States opposes the construction of the Juragua nuclear power plant, because of our concerns about Cuba's ability to ensure the safe operation of the facility, and because of Cuba's refusal to sign the Nuclear Nonproliferation Treaty or ratify the Treaty of Tlatelolco."

And he went on to say other things in the letter. And the letter recently basically, in response to the letters that we have sent again to the President with our colleagues, ratifies that position. But we would like to see a stronger position taken. We would like to see a stronger position taken. And let me outline briefly why.

Mr. Chairman, I have a map there. It is the impact on America, for those who wonder if this is a Castro thing. No. This is the impact on America of a nuclear reactor accident in Cuba. It shows based upon testimony that exists in the GAO report what either summer or winter winds could do in the case of a nuclear accident in Cienfuegos.

In that respect, nearly, I believe, 80 million Americans from Texas to Louisiana to Arkansas to Mississippi to Alabama to Florida, Georgia, Tennessee, South Carolina, North Carolina, Maryland, Virginia, and the Nation's Capital itself could in fact be in danger. That is 1 out of every 3 Americans.

According to a study by the National Oceanic and Atmospheric Administration, summer winds could carry radioactive pollutants from a nuclear accident of the power plant through all of Florida, and parts of the States on the Gulf Coast as far as Texas. And northern winds could carry the pollutants as far northeast as Virginia and Washington, DC. And clearly, many more States would be affected in time. This is without looking at the impact to Central and South America, and the Caribbean.

So when people ask is this just strictly a Castro thing, as some have said, I say that it is in the national interests of the United States and of our hemispheric neighbors to be paying attention to the concerns that even Germany had when it closed four similar, exactly similar, nuclear power plants upon its reunification, recognizing, recognizing, the dramatic danger that it posed to its people.

And we will not only be pursuing the national interests of the United States and the interests of the hemisphere, Mr. Chairman, but we will also be pursuing the interests of the Cuban people, who do not seem to have their best interests put forth by the dictatorship, who would risk lives in the search for energy and to keep up his dictatorship propped, who would risk finishing up a nuclear power plant that other civilized countries have closed.

I think that is the nature of what the hearing is today, and I want to commend you again for holding the hearing. I ask that my full statement be entered into the record.

Mr. BURTON. Without objection.

[The prepared statement of Mr. Menendez appears in the appendix.]

Mr. BURTON. My colleague, the ranking Democratic member, MR. Torricelli, do you have any opening comments?

Mr. TORRICELLI. I will pass, Mr. Chairman.

Mr. BURTON. The gentleman has passed, and will reserve his comments for questioning.

We will have people testifying later today that will talk to us about the workmanship at the plant, and I think that will shed a lot of light on this issue.

I would like to point out that Mr. Menendez talked about the impact on the United States. We do not have the specific numbers on what kind of casualties or injuries we would see in other parts of our hemisphere should this happen, but we will try to get that information.

We now have before us two illustrious Congressmen, Peter Deutsch, Democrat from Florida; and Congressman Lincoln Diaz-Balart, Republican from Florida. Before we recognize Mr. Deutsch, I understand that our good friend, Mr. Diaz-Balart, who is a very prominent member of the Rules Committee has to depart shortly. So with your indulgence, I would like to have Mr. Diaz-Balart make his statement.

STATEMENT OF HON. LINCOLN DIAZ-BALART, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. Diaz-Balart. Thank you, Mr. Chairman. And thank you, Mr. Deutsch. And members. I will be very brief.

I think that it is critical that it be made known by the United States to Russia that the power plants that they designed and commenced construction on in Cuba cannot be completed. Russia has every intention to proceed to complete the nuclear power plants, as Ms. Ros-Lehtinen has stated. Some say that there is confusion on that. The bottom line is that we have to take them at their word.

They have stated that they have every intention to complete the plants. I think that what is essential here is to realize that four plants of the identical design that existed in Germany, in Eastern Germany, were closed down forthwith upon reunification. These so-called VVER plants, even if the construction were not defective, the design is so inherently dangerous that in Germany they closed them down.

And it is important to keep in mind that Cienfuegos is closer to Key West than Dresden is to Bonn. Yet the Germans, just because of the design, immediately closed them down.

Now what we are dealing with here, there are two points that I would like to make. No. 1, the Cuban dictatorship obviously is not only uninterested in nuclear safety, but it is engaging in a policy that I know of no other government in the world at this point is engaging in.

When you see a regime that is in the business for dollars to let companies dump chemical waste on its soil like Castro is in the business of doing in order to obtain hard currency. There is a Canadian company, the members of this committee know of it. It extracts nickel from eastern Cuba, processes it in Canada, and then the chemical waste pursuant to a deal with Castro is dumped on Cuban soil and in Cuba's waters. When you see a regime, a dictator, that engages in that for hard currency, you realize that there is no interest at all in safety.

On the contrary, it makes us think of the other issue that I think is so important with regard to these plants. Castro, again just a few days ago, threatened the Clinton administration that he will unleash immigration blackmail upon the United States, if something that we, our domestic parliament, Congress, is talking about, your legislation, Mr. Chairman, if we pass it, Castro has once again threatened the Clinton administration that he is going to unleash immigration blackmail, despite the May 2 deal that he already achieved with President Clinton.

I think that that should make us realize what a nuclear plant in his possession would allow him to do with regard to blackmail. Just think of the possibility of blackmail. Like he says, when he tries to blackmail the administration, "I do not know if I can control my borders. I do not know if I can control the safety of the plant." We can already visualize him doing that.

So it is simply not acceptable to the interests of the United States, as well as obviously the interests of the Cuban people, but the Cuban people cannot speak at this moment in their history, for those plants under this tyrant to be completed.

A source had informed me, Mr. Chairman, that at that meeting, at the meeting he instructed Alarćon, his negotiator, to once again blackmail our government. Just a few days ago, Alarćon told the Cuban dictator, with all respect, Mr. President, that it might be risky to reopen that issue (the immigration issue) with President Clinton, that we have a deal. And the Cuban dictator ridiculed President Clinton and said, "He has no back bone, and his knees shake."

The bottom line is that this is a man who has no respect for President Clinton. And I will say it as a member of the opposition, I think that is intolerable for the President of the United States, whoever he is, to be treated like that and to be ridiculed like that by any foreign head of state, especially a thug like Castro.

We cannot let him have in his possession another instrument of blackmail like this nuclear plant would be. And that is in addition to all of the other issues that the distinguished members of the subcommittee and the experts will bring up with regard to the design.

So I commend you, Mr. Chairman, for carrying forth with this hearing on this critical issue. And we look forward to learning. We will subsequently read the testimony of the experts today.

And once again, thank you, Mr. Chairman, and Mr. Deutsch, for letting me testify at this point. Thank you.

Mr. BURTON. Thank you very much for being late to your Rules Committee meeting. We appreciate your attendance.

Mr. Deutsch.

STATEMENT OF HON. PETER DEUTSCH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. DEUTSCH. Thank you, Mr. Chairman. I have a statement that I would like to submit for the record and not read, and just really summarize it.

Mr. BURTON. Without objection.

Mr. DEUTSCH. This is something that I think that all of the members of this committee I know have read, but I would hope really that all Americans would read. It is a GAO study of the facility. And it is obviously quite disturbing.

And I think the Chairman and Mr. Menendez in particular for really highlighting this issue for the American people. Because the reality of what is going on at that facility is incredibly disturbing, not just to those who lived in Florida, but as clearly as those maps show to almost half of the United States of America from Texas to Washington, DC.

And again, we do not know the exact numbers, but we do know numbers based on Chernobyl, which the destruction of Chernobyl is still occurring. And that there are estimates that over 2 million people ultimately will end up dying because of the contamination from that facility. Cancer rates are 4,100 times, 4,100 times, based on the accident that occurred in Chernobyl.

There are a couple of things that I would highlight. This facility does not meet any standards acceptable by this country in terms of nuclear plants, even without the defects which you will hear testimony about today. And I specifically would point out again, and the committee members, I am sure you are aware, that in the United States, the design is 50 pounds per square inch throughout the entire containment structure. The design of this facility is only 7 pounds per square inch. And again, we do not have to be nuclear engineers to understand what that difference means. As I mentioned, I would point out that that is without the design that you will hear about today.

The issue of completion of that facility, and this is something that I actually anxiously await testimony. Mr. Fulty's recent testimony that he submitted talks about, and again this is an issue that I know that Congresswoman Ros-Lehtinen has really focused on as well, is just what is going on out there.

The GAO spoke to a number of companies, two of which apparently are performing today a financial and technical feasibility study for a Russian company designed to evaluate the cost to complete the Cuban reactor.

That is obviously very disturbing news, very disturbing news. And I would hope that we can just directly from the United States government be incredibly direct to the Russian government about our interest in this area in terms of final completion of that facility.

This issue raises to the level of a national security concern. It is the only facility anywhere near the United States. We have a regulatory structure in terms of nuclear facilities which is very, very severe for a variety of reasons in this country.

The massive destruction that occurred in Chernobyl is something which is real, which occurred, which people need to internalize and understand. If there was the possibility of 2 million Americans dying in a conflict, it would clearly be a national security concern.

Unfortunately, I think that is what we are dealing with. Not just what I think, but that is what the facts show us, that we are dealing with at this facility. I think that the administration can do more, and has to highlight this at the absolute highest level.

But beyond that, what I think that we are also understanding in this issue is that this issue and others like the immigration issue will not change until the Castro dictatorship changes. And I think that really is the underscore that everyone in this Congress needs to understand.

Mr. Chairman, I commend you with your legislation. Clearly, the seriousness of it and the effectiveness of it is matched by the Castro regime's response to it, and how they have responded to it publicly, as Mr. Diaz-Balart has mentioned. That is what we need to do. Not to just deal with this facility, but to deal with a variety of problems that the Castro dictatorship has brought upon South Florida in particular, but the United States of America in general.

And I, too, will spend as much time as I can at this hearing to hear from the witnesses. And hopefully, not just the people here, but the entire Congress and the American people will take this, and the administration, as a national security issue for the future.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Deutsch appears in the appendix.]

Mr. BURTON. I thank the gentleman for his comments. If you prefer, we would love to have you join us up here on the dais to question our witnesses.

The next witness that we have is Richard Stratford, Director of the Office of Nuclear Affairs for the Department of State.

Mr. STRATFORD. Thank you, Mr. Chairman.

Mr. BURTON. We would like to have your statement submitted for the record, and have you abbreviate it if possible.

STATEMENT OF RICHARD J.K. STRATFORD, DIRECTOR, OFFICE OF NUCLEAR ENERGY AFFAIRS, DEPARTMENT OF STATE; ACCOMPANIED BY ROBERTA JACOBSON, DEPUTY DIRECTOR FOR POLICY PLANNING, LATIN AMERICAN BUREAU

Mr. STRATFORD. Thank you, Mr. Chairman. I appreciate that. And I think that we can manage to cut my written statement down to about twelve paragraphs.

Before I start, I would like to ask to join me, if I may, one of my colleagues, who would be better prepared than I would to respond to perhaps some of the political questions that might come up. And if I may, I would like to introduce Roberta Jacobson from our Latin American Bureau, who is the Deputy Director for Policy Planning, and the former Acting Director of Cuban Affairs in the Department of State.

Mr. BURTON. Without objection, Ms. Jacobson will join you.

Mr. STRATFORD. Thank you, Mr. Chairman.

I would like to address just briefly the status of the Russian-supplied reactors which have been under construction in Cuba, and our best understanding of the safety concerns raised by that project, and some of the steps that we have taken to try to resolve those concerns over the years.

To begin, let me briefly review the history of the project. In 1976, the then Soviet Union and Cuba concluded an agreement to build two pressurized water reactors near Cienfuegos on the south central coast of Cuba, also referred to as the Juragua project.

Construction of the units which began in 1983 was a high priority for Cuba, because it sought to reduce its heavy dependence on imported oil. Even in the early years of the project, there was a great deal of interest on our part in Cuba's ability to develop the infrastructure necessary to construct and safety operate a nuclear power plant. In order to learn more about that nuclear program, the State Department supported a visit to Cuba by officials of Duke Power, who were visiting on behalf of the World Association of Nuclear Operators, accompanied by a senior official of the Nuclear Regulatory Commission.

In September 1992, construction was halted, because Cuba could not meet new Russian financial terms, which apparently stipulated that further work would have to be reimbursed in payment in convertible currency.

Our understanding is that in November 1992 Cuba and Russia did agree to resume construction on the plant, but on the condition that a third partner had to be found to supply additional safety and instrumentation equipment, and to help finance the project. And that condition was apparently not met, because the only other moneys that had been forthcoming of which we are aware is the $30 million credit line to Cuba from Russia for the mothballing of the plant.

We have made known our safety and our safeguards related concerns to the governments of countries in which potential suppliers are located. We had gained assurances over the years that licenses will not be issued for the export to Cuba for equipment of that nuclear energy program until Cuba has undertaken a comprehensive nuclear safeguards commitment.

We also relayed our concerns to the Russian government as recently as June of this year, and asked that the government of Russia not participate in completing the plant.

Mr. Chairman, estimates vary as to the cost of completing both reactors. There are a lot of numbers. At the high end, the estimates for completing both reactors range well over a billion dollars. And for completing the first unit, approximately $300 million.

Now we would characterize the first unit as being about 90 to 97 percent complete, but that number is a little misleading, partly because only 40 percent of the reactor's internals have been installed, and partly because primary system components have not been installed, and the fuel has not been delivered. And the fact is that Cuba does not have the money to pay for completing the reactors.

Mr. Chairman, there was a lot of interest in who is doing what with respect to the potential for completing these reactors. I must say that is a little unclear. The characterization that one or two companies are participating in a feasibility study is correct. That is my understanding.

It is also my understanding that Russia and perhaps Cuba have been out there contacting companies in various countries to say, "Would you be interested in getting involved in this project?"

Now we have gone to those companies, too. And what we hear is "we have not decided to get involved in that project." We have also gone to the governments concerned. And we hear "no, there has been no decision to permit anyone to get involved in this project."

So I think that one has to take the reports of potential going ahead with a bit of a grain of salt, particularly when you consider that the Cuban government is likely to have the worst sugar crop in fifty years, does not have hard currency, and really is not going to have very much even for some form of a barter transaction.

Mr. Chairman, pages 3, 4, and 5 of my text provide a detailed technical description of the project, including a brief discussion of how these reactors differ from the other Russian designs. We do talk briefly about the safety concerns that have been raised and expressed by DOE, by NRC, and by the Cuban emigres who are familiar with the project. And I think that those concerns are well summarized in the GAO's 1992 report.

Mr. Chairman, I see that my 5 minutes are just about up. I just want to point out that we do not have proliferation concerns about the Cuban nuclear program. We do believe that nobody should supply that program until Cuba has ratified the Treaty of Tlatelolco, and has in effect a nuclear safeguards agreement. Moreover, even after that occurs, we still think that others should not help the Cubans finish those reactors as long as there are serious health and safety concerns about those reactors.

Mr. Chairman, finally, let me just say that we do intend to keep a close eye on the project. We do intend to continue to approach foreign countries to urge them not to complete this project, unless it is perfectly clear that it is going to be safe.

And I think that probably the best statement of our policy is contained in the two letters from the President. The first of which in 1993 said, "Last week in Vancouver, I discussed this issue with Russian President Boris Yeltsin underscoring the seriousness of our concerns." And in the second, the President's letter of July 24 of this year said, "We have continued to press Moscow to address our concerns about the facility. As recently as June 22, we urged Russia not to move ahead with the project. We have also voiced our concerns to the governments of countries that might supply the equipment needed." And the President closed by saying, "I assure you that we will continue to give this issue the high priority that it warrants."

Mr. Chairman, I can think of no higher intervention with respect to this project than intervention by the President himself with Boris Yeltsin.

I assure you that we share your concerns. I assure you that we will continue to keep a close eye on the project. And I assure you that we will continue to go to those who might wish to supply this project, as long as there are health and safety concerns. Thank you.

[The prepared statement of Mr. Stratford appears in the appendix.]

Mr. BURTON. Thank you for your comments.

I think that everybody in America who is familiar with nuclear power understands about the threat that we face if an inferior reactor is produced in Cuba. The map that is shown there by my colleague, Mr. Menendez, spells out very vividly the dangers to the American people.

Now in Indiana, my home State, we had a nuclear power plant that was under construction called Marble Hill. It was meeting all of the standards that our government proposed, yet the safety concerns were so great that after that project had been under way for a couple of years, it was stopped because of the fear of the American people that there would be a Chernobyl-type accident that would wipe out many people in the Midwest.

So while we believe that nuclear power can be a very safe product for us to utilize in the United States, it is obvious that there are some safety concerns, and we want to make sure that we they are met.

We have been led to believe by the GAO report and by people who have actually worked on this plant in Cuba that there is inferior workmanship.

My colleague who just testified a few moments ago indicated that in the plant there is supposed to be 50 pounds per square inch pressure, and it is only 7 pounds per square inch. That is less than one-seventh of an acceptable rate.

When the administration says that they are going to watch this closely and to put pressure on our allies to ensure plant safety and that it is not going to endanger the entire southern third of the United States, Mexico, Central America and the Caribbean, it kind of sounds a little thin. Because people who have worked on it have said that it is an inferior product.

What does the administration plan to do? What specific steps do they plan to employ to make sure that our allies are not funding a project that is going to endanger a large part of our hemisphere?

Right now, we understand that British, Brazilian, German, Italian, and Russian companies are going to be involved in financing this venture. This is not going to endanger any of those nations the possible exception of Brazil, so their safety concerns are not nearly as strong.

So what specific steps has the administration indicated that they are going to take to protect American citizens from a possible Chernobyl-type disaster?

Mr. STRATFORD. Mr. Chairman, the specific steps are to continue to go to the government of any country which we feel would make a financial commitment to the project, and urge them not to do so as long as there was any question about the health and safety aspects of that reactor.

I recall in the President's letter of 1993 that he said we would continue to approach countries, and we have. I would note that we approached France in February 1993. And Italy, Germany, France, Japan, and Russian in February 1993. In Russia, Mr. Yeltsin himself, in April 1993. France, Italy, UK, Germany, and Brazil in February 1995. France in March 1995. Brazil in April 1995. And Russia at the vice foreign minister level in June 1995, this year.

Now it is not clear to me that in fact countries or companies have committed at all to participate in the project or to provide financing. I heard the phrase "joint stock company," and I think that it is probably fair to say that if there were any stockholders in that company, they are Russia and Cuba, and nobody else at the moment. And until there is a stockholder who is prepared to pay for his shares, there is not going to be any money to finish those reactors.

So the answer is we will continue to talk to those countries. We will continue to take up that issue. But as far as we know at the moment, people are not jumping into this willy nilly to complete those reactors, and the plant remains at a mothball stage.

Mr. BURTON. This plant is 97 percent completed. It is of inferior design and quality, according to the GAO. According to nuclear people with whom I have talked, when you go back and start to retool a nuclear plant that is one-seventh up to U.S. standards, you are messing with dynamite. In fact, you are messing with worse than dynamite.

This plant is inferior. They have no regulatory commission in Cuba that is that is going to monitor it. Yet here we are saying we are going to talk to these people, and we are going to try to put pressure on them. It seems to me that the State Department and the President should tell them that we do not want that plant completed.

The GAO report says very clearly that it is of inferior quality. And the people with whom we have talked have said that these standards are not adequate to protect the Cuban people, let alone the American people. It seems to me that the administration ought to be very strong.

Mr. Lincoln Diaz-Balart said that the Foreign Minister of Cuba said in a private conversation that President Clinton has "wobbly legs," indicating that he is weak and vacillating on these issues. This is one issue that President Clinton must not vacillate on. I do not like to hear anybody talk about our President in this manner. I believe that he has the ability to stand up and be reliable for an issue of this magnitude. The American people do not want a Chernobyl-style disaster occurring in Cuba.

These foreign companies that have indicated an interest in helping complete this plant when it is 97 percent completed is a recipe for disaster.

I hope that you will take this message back to the President and to the Secretary of State, Mr. Christopher: we believe that in the strongest language possible we should tell our friends, (especially those who are getting significant amounts of foreign aid like Russia) that we do not want them supplying hard currency to Castro to complete a plant that is going to endanger not only his country, but the entire hemisphere.

Mr. STRATFORD. Mr. Chairman, if I could just say in a two sentence response. First of all, I do not think that I disagree with a single word you said. Second of all, I think that the message that I have gotten from the members so far, if I characterize it correctly, is that the members of this committee would like to be sure that the administration is going to highlight this issue at the highest levels of the Russian government and elsewhere.

Mr. BURTON. Let me take it one step further. Stop it, not highlight it. The Juragua plant that is 97 percent completed is inferior in quality, is a danger to the entire hemisphere, and should be stopped. We should send that signal very clearly to all of our allies. Mr. Menendez.

Mr. MENENDEZ. Thank you, Mr. Chairman.

Mr. Stratford, I hope that you are right in that grain of salt that you referred to that melts away and none of us have any concerns.

In 1993 that Russia gave Cuba $30 million to mothball. You do not spend that type of money if you are not looking to finish off your investment, so that you can promote your reactor worldwide as something that works.

And I would not downplay the interest of Russia in promoting completion of such a plant, especially if you look at the fact that the investment that we consistently hear about being generated by other countries than Cuba is going to ultimately put greater and greater demands for energy. And that energy has to be supplied in some way.

So the fact of the matter is that there are going to be great demands on the very interests that are investing that are going to need the energy may very well be the interests that while they have not committed to date. And I as a company or a country who would be considering such an investment would not put forth that I am considering such an investment until I know that the stock group is ready to be formed in its entirety. Why take that risk, why take that unneeded step.

So I would now downplay the possibility of this as a grain of salt. I hope that we are more successful than we have been throughout the world in convincing our allies and other countries about what our policies should be vis-a-vis Cuba. Because if our success in this matter is the same success that we have had in other respects, then we will fail and the plant will be built.

I would like to ask you based on your written statements and questions: you say on page two of your statement in your second paragraph that we clearly are not supportive until Cuba has undertaken a comprehensive nuclear safeguards commitment, what does that mean?

Mr. STRATFORD. What it means is, that both under U.S. law and policy, we cannot cooperate in the nuclear area with a country until it has made a binding commitment to place all of its nuclear materials under international safeguards now and forever. And all of the other major nuclear suppliers, except China, have adopted that same commitment in a document called The Nuclear Suppliers Guidelines.

Now that essentially means that the other suppliers who have been referred to here today will not supply a reactor to Cuba or engage in nuclear cooperation with Cuba until Cuba ratifies the Treaty of Tlatelolco, and brings into force an international safeguards agreement.

But that is something that is likely to happen fairly soon. Because Cuba has signed the treaty. There is an upcoming meeting of the national assembly within the next couple of months, and they may ratify the treaty. Adoption of a safeguards agreement is a relatively pro forma matter if Cuba wants to sign it.

So that is not the big issue. That will not stand in the way of the rest of the suppliers in the world for much longer. But I think what will stand in their way are the concerns about safety. And the point that I really want to leave the committee with is——we have made those concerns known to other governments.

Now I am not the least bit surprised that Russia and Cuba get together and say “I am sorry, we plan to finish this plant”. I would expect Russia to tell the Cubans that. I would expect them to make that announcement and to seek cooperation. Now whether they get that cooperation or not, I think is a very difficult question. And my judgment is they will not.

Mr. MENENDEZ. Reclaiming my time. My specific question was are you telling me that the ratification of the Treaty of Tlatelolco is sufficient to remove our concerns?

Mr. STRATFORD. No.

Mr. MENENDEZ. What is the next step after that, if you can be precise?

Mr. STRATFORD. Ratification of the treaty followed by the acceptance of international safeguards over all nuclear materials in Cuba is sufficient to satisfy our proliferation concerns. It does nothing to satisfy our safety concerns.

Mr. MENENDEZ. Is the ratification of the nuclear nonproliferation treaty part of our concern?

Mr. STRATFORD. Mr. Chairman, we do not distinguish between the NPT or Tlatelolco. It is pick one or pick the other for practical purposes.

Mr. MENENDEZ. With reference to the statement on that same page where you say that the government has relayed their concerns to the Russian government in June 1995, at what level was that?

Mr. STRATFORD. The notes that I have here say that that concern was expressed to Mr. Mamedov, who is the deputy foreign minister, the equivalent of Strobe Talbott.

Mr. MENENDEZ. In the Russian government?

Mr. STRATFORD. In the Russian foreign ministry, that is correct.

Mr. MENENDEZ. And what was their response?

Mr. STRATFORD. I do not have the actual response with me, and I would hesitate to characterize it. I would not be surprised if it said we understand your concerns, but I am sure that you understand that we have plans to complete.

Mr. MENENDEZ. Mr. Chairman, I would ask that the responses be submitted to the committee through you, the formal response, so that we could have a greater sense of it.

[The information referred to follows:]

Ambassador James Collins met with Russian Deputy foreign Minister Mamedov in London on June 22 to express our treaty-related and safety concerns regarding the Juragua plant and urge the Russians not to proceed with the construction of the facility.

Mamedov told Ambassador Collins that the Russians were aware of our concerns and assured him that there was no international financing available to complete the project.

Mr. MENENDEZ. It appears to me that we better be extremely vigilant. And my concern is that as we continue to move forward in the altering course that the administration seems to have embarked on, that I hope that this is not a negotiable point.

Everything that we have read about this particular plant that is unfinished, and we are talking about $300 million, and even for Cuba that is not impossible. I know you can talk about the worst sugar crop, and you can talk about all of its dire needs. But with the types of moneys that are being sought to be invested in Cuba by other places, the fact of the matter is, and with the energy needs that are going to exist, $300 million is not an unsurpassable obstacle.

So I think that we are a lot closer to the verge of this than your testimony might indicate.

Thank you, Mr. Chairman.

Ms. ROS-LEHTINEN. Thank you, Mr. Menendez.

Mr. Stratford, I would like to ask you some questions using the North Korea model. Some of us are worried that if the United States recognizes, as the Clinton administration has done in the letter that he wrote to us last week, that there are some serious questions about the construction, the design, and the supervision of the plant, that then the response might be we have got to go to Cuba, send our technicians, send our engineers, send all of the professionals that we have, and shape up that plant, so that it no longer poses a threat to either Cuba, the Caribbean, Central America, or the United States.

The United States has been involved in the North Korean nuclear plant operation, if you want to call it that. If you could discuss with us in general and in specific terms what are the similarities and the differences in such an effort.

Is North Korea currently a signator of this nonproliferation treaty, and what are the differences in the efforts of the United States to provide North Korea with nuclear power plants and the Russian efforts to provide such a plant to Cuba, et cetera, and would the administration ever consider providing such assistance?

Mr. STRATFORD. Well, let me first say that the two situations, North Korea and Cuba, are two completely different problems. The North Korea problem was a proliferation problem. Namely, that if left on the track on which they were going, the concern was that it could have led to a nuclear weapons capacity in North Korea. Or if you accept the testimony of some, a greater nuclear weapons capacity in North Korea, and that had to be stopped.

And the fundamental bargain was that everything in North Korea would go under strict international safeguards, and the nuclear reactors which they had started to build which were of a kind that is especially well designed for producing plutonium, that those would be stopped and taken down. And in return, they would get an American style light water reactor which is not well suited to producing plutonium, and which would contribute to the power in their grid.

And presumably since that reactor would be of American design built by Americans and perhaps South Koreans and others, safety would not be an issue, particularly since there are many, many years to create a safe infrastructure in North Korea.

The Cuban problem is not a proliferation problem. It is a safety problem. And we do take seriously the concerns that have been expressed by NRC, by the GAO, by the Department of Energy, and by the Cuban emigres who are familiar with the project.

Now in this particular case would we assist that project? Would we allow ourselves to be driven into a corner and to say "well, if they are going to go ahead anyway, why do we not just help them?" And in fact, I noted that in the written version of Mr. Robinson's testimony here today, that he pointed to some language that apparently the State Department used, which as a matter of fact I have in front of me, which says that in the event that construction were to proceed, we would vigorously pursue initiatives aimed at improving the safety of the facility and promoting its safe operation.

Now I am not sure that it is as simple as that for a very simple reason. Let us say that Russia said "well, we are going to finance it after all, we are going to go forward." The first thing that we would want to know is what is the real situation down there, are the allegations correct, is it safe, is it not safe, what about the welds. And I think that we would want to know the answer to these questions.

I suspect that the way that we would get those answers is to encourage the IAEA to go in and do its own review of the situation. Because if we were to proceed down the road of providing assistance, or providing people, of doing anything to help the plant, I think that the rest of the world would just see that as the United States throwing in the towel on what might be an unsafe plant, and to say "since you are in there helping them, we might as well go in and join in on the building and get some hard currency out of this."

So I think that for me to say that "yes, we would assist them at some point" is way too early a conclusion and way too, I think, facile a conclusion to draw at this time. I think that it would just encourage those who do not need to be encouraged.

Ms. ROS-LEHTINEN. And I think that the time is critical right now to stop the completion from taking place. And I think that if we do not take a proactive strong approach, that it will be completed, and the other plant will be operational. And then we will find ourselves in that terrible dilemma. And I hope that if and when we face that problem, that our answer will be no, that we would not be sending our American engineers over there to help Castro out of the jam. So the time to stop it is now. And I hope that we do not find ourselves in that situation.

So the risk is there. And I think that is part of the congressional duties. We have done more than we can to highlight this issue to the administration. And I appreciate your willingness to continue working with all of the officials to making sure that they understand that the congressional intent is very clear.

As the chairman said, we not only want it highlighted and our concerns highlighted, but we want the plant stopped. And if not, we are going to find ourselves in a very difficult situation down the road. But those decisions are best met now earlier rather than later.

Mr. Menendez.

Mr. MENENDEZ. Madame Chair, just briefly.

Ms. ROS-LEHTINEN. Of course.

Mr. MENENDEZ. I have one question.

Is there anything—I have looked through your entire testimony, and I do not see it, and I just want to make sure for the record—is there anything that would dispute what the National Oceanic and Atmospheric Administration says in that chart, that if the plant is reconstructed, and if there was to be an explosion, that those winds would take that radioactive material and cover that part of the United States, do you have your own expertise to dispute that?

Mr. STRATFORD. I am not a technical nuclear expert. I do have something from the Department of Energy which says very briefly that if there were a very serious accident, that yes, the radiation could reach the United States. And that is about as much as I have. So I will take that as a confirmation that there are serious problems.

Now whether or not there could be an accident of that severity is the kind of thing that NRC and DOE would have to look at hard. When I talked to NRC about the situation, one of the things that they said to me is, "Now, remember, Dick, that we have not made an official final judgment on the safety of this plant. And we would not do that based on a scarcity of information that we really do have, but we do have concerns."

So would there be an accident of that severity, is that a likelihood, I do not know the answer to that. Do we have concerns that it could happen, yes. If an accident of that severity did happen, could there be radiation in this country, yes.

Ms. ROS-LEHTINEN. Thank you.

Thank you very much. And Mr. Stratford, I understand that you will be here with us for awhile in case there are some other questions from the panelists.

Mr. STRATFORD. That is fine.

Would you like me to stay here, or should I just come up when you need me?

Ms. ROS-LEHTINEN. Just join the audience, and then we might have some follow-up questions. Thank you so much.

Our next panelist is Mr. Keith Fultz. He is the Assistant Comptroller General for Energy and Science Studies at the General Accounting Office, GAO. And we are very pleased to have Mr. Fultz with us today. You are recognized for an opening statement, Mr. Fultz. If you could identify the gentlemen with you.

STATEMENT OF KEITH O. FULTZ, ASSISTANT COMPTROLLER GENERAL, RESOURCES, COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE; ACCOMPANIED BY EUGENE E. ALOISE, ASSISTANT DIRECTOR FOR ENERGY AND SCIENCE ISSUES, RESOURCES, COMMUNITY, AND ECONOMIC DIVISION; AND DUANE G. FITZGERALD, NUCLEAR ENGINEER FOR ENERGY AND SCIENCE ISSUES, RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION

Mr. FULTZ. I would be happy to. To my right is Dr. Duane Fitzgerald, who is a nuclear engineer who works for GAO, and has assisted us on this and many other reviews in the nuclear area. To my left is Mr. Eugene Aloise, the Assistant Director at GAO, who has been responsible for much of our nonproliferation work.

Madam Chair, I will summarize my statement, but I would like to have my entire written statement be made part of the record. And I will even summarize more than I had intended to today. Because much of what I had intended to cover has already been discussed by the previous witnesses or members including some on the committee.

I would say that GAO has been concerned about these two reactors for a number of years, in fact since the issuance of our 1992 report. Now, as you know, a few weeks ago, a NBC news team was actually granted permission to go onsite to the reactors and filmed extensive film footage of the reactors both inside and out. They were very gracious and shared that footage with us.

What I would like to do in a few minutes is show you some slides which we have taken from that film footage, which I think graphically depicts the condition of these two reactors as it was as recently as perhaps 2 or 3 weeks ago. And I think that will be very, very enlightening for you and members of the audience.

I would say that at the basis of our review of this film, and I think that this is probably the most current information that we have to examine, that if we had concerns in 1992 and we did, we have much more serious concerns today about the quality of those reactors.

I believe that you would agree that the film graphically portrays a nuclear plant that is in a serious state of deterioration, and appears to be abandoned rather than properly maintained.

And I would respectfully disagree with the previous witness from the State Department. I would in no way characterize these plants as mothballed. I would say that they were abandoned. And the deterioration that has occurred in the last three to 4 years in our characterization is quite serious.

I would also like to mention that we have heard an awful lot of discussion about the containment dome. And I think that is very germane and very useful. I would also mention that the pressure/suppression system which is supposed to control any type of an accident before release would get to the dome is an unproven and untested system also. And I would just like to keep that in mind.

We also talked to some of the emigres who are now in the United States or elsewhere about what they saw at the reactors, and they expressed some of the same concerns to us that they might have to you or your staff or others.

There is a concern about a lack of a quality assurance program at the reactors, and a lack of an infrastructure within the Cuban government to assure that the reactors were built in a safe and sound manner to make sure that they would function in a safe manner.

They also could not guarantee that certain parts and in some cases some key valves in the emergency core cooling system would work if needed. And that is another key point that I would like to mention.

We have heard some discussion about welds. We talked to one technician who told us that he examined x-rays of about 5,000 welds, and found that about 10 to 15 percent of those welds were defective. That is a rather high number. We were also told that some of these welds were not fixed on the containment dome. And you will see some slides of that container dome in just a minute. That they were concreted over without being fixed. Now this could pose some rather significant problems in the future.

In summary, we have had a number of concerns for years about this reactor. The information that we have currently heightens our concern. And we would certainly agree with the philosophy that the United States needs to be concerned about the completion of these reactors, because we think that they have some rather serious safety issues.

We believe that continued monitoring of Cuba's progress toward completion of the reactors if it goes forward is absolutely necessary.

Now with that, I would like to indulge you for two or maybe 3 minutes and show you the slides.

Ms. ROS-LEHTINEN. Yes, go right ahead.

Mr. FULTZ. If you have any questions, please feel free to interrupt me or to raise questions or reactions about the slides.

Ms. ROS-LEHTINEN. Thank you.

Mr. FULTZ. I think that we have to have the lights turned down. Again I would like to mention that NBC did share with us their film footage that they took at the reactors, and we took the slides off of that film.

[Slide.]

Mr. FULTZ. This is Unit 1. As you have heard today, it is about 90 to 97 percent complete. It is a 440 megawatt reactor, which is a medium sized reactor. And it is estimated that it is going to cost about $300 million in about 4 years to complete construction of this reactor.

[Slide.]

Mr. FULTZ. This is the containment dome over Reactor 1. You will be seeing a few more slides of that in just a few seconds. That shows the scaffolding on the reactor as it now sits.

As you can see near the top of the slide, the scaffolding and the work of this construction looks to be very haphazard. Here is a further and a close-up view. You can see that the scaffolding by my characterization is very haphazard. And it also shows significant signs of deterioration and rust.

Ms. ROS-LEHTINEN. Can these slides go a little faster?

Mr. FULTZ. Yes, sure.

Ms. ROS-LEHTINEN. Thank you.

[Slide.]

Mr. FULTZ. This is the scaffolding that you can see in the upper right-hand corner where the boards have actually fallen or have been taken for other use. And again, you can see the rusting.

[Slide.]

Mr. FULTZ. This is an example of the concerns that we have about what was used to design these reactors. The ladder certainly would not be safe for workers. You can also see evidence of weeds growing out of the concrete. If you look very closely in the lower right-hand corner, it appears to be moss growing out of the containment vessel.

[Slide.]

Mr. FULTZ. This is an overview of Reactor 2, which is about 20 to 30 percent complete. It is estimated that it is going to cost about $500 million to finish, and I think 7 or 8 years. And as you can see, it is exposed to the environment, the weather, salt vapor, and so forth.

[Slide.]

Mr. FULTZ. This is the inside of Unit 1. If you notice, the upper right-hand portion illustrates the rusting that has occurred on the pressure/suppression system, I will show you a few more examples and closer up views of that, as well as the haphazard nature in which the material is being stored on the floor.

[Slide.]

Mr. FULTZ. This again illustrates the rust deterioration of the inside wall of the reactor. And I have one more to show.

[Slide.]

Mr. FULTZ. It is very possible that if these reactors are ever completed that much of these piping and tubes would have to be taken out and new ones put in.

[Slide.]

Mr. FULTZ. This is another example. This again is in Reactor 1, which appears to be an air system of some sort that has deteriorated and has basically been strewn all over the floor of the reactor.

[Slide.]

Mr. FULTZ. This is the reactor vessel that is being stored in a metal shed. If you notice on the lower right-hand corner, you can see some light, and I will explain what that is in just a second.

[Slide.]

Mr. FULTZ. We were told that the reactor vessel itself is being properly maintained and prevented from corrosion. But as you can see in the lower right-hand corner up to the upper right-hand corner along the lines of the holes there, there seems to be rather significant deterioration, the degree to which would have to be studied and analyzed extensively before anything would be further done with this vessel.

[Slide.]

Mr. FULTZ. Here again, if you look at the upper left-hand portion of this slide, you can see that the shed that this vessel is stored in basically had a roof that has about a three foot opening around the perimeter of the building, which is allowing the salt air vapor to get in and perhaps impact on the vessel itself.

[Slide.]

Mr. FULTZ. And the next slide will show you an outside view of the building where the reactor vessel is being stored.

[Slide.]

Mr. FULTZ. You can see that it is all open. In fact, that door does not close, again just further evidence of the lack of concern for maintaining very expensive equipment.

[Slide.]

Mr. FULTZ. This is the control room for Unit 1. As you can see, it is basically empty, and will require hundreds of millions of dollars, and a lot of time to bring this reactor control room up to operating condition.

[Slide.]

Mr. FULTZ. Now the next three slide I will go through very quickly. They again illustrate the location of the reactor in relation to the United States. This is another graphic of where the plume could conceivably go given the summer season. As you can tell, as was stated by Mr. Menendez, this is potentially affecting 7 to 8 States and about 52 million people in the United States, as well as parts of Mexico, if there were a severe accident.

[Slide.]

Mr. FULTZ. And the next slide will show the winter season, which is more westerly prevailing winds, which would impact all of Florida, much of Georgia, and the southeastern United States up to and including perhaps Washington, DC.

Now that concludes the visuals that we have.

[The prepared statement of Mr. Fultz appears in the appendix.]

Ms. ROS-LEHTINEN. Thank you. Thank you very much. And in this romantic setting, we will recognize Mr. Menendez. You will have to speak really softly.

Mr. MENENDEZ. Thank you, Madam Chairlady.

I appreciate your testimony. Let me just ask you a couple of things.

Did I hear you right when you said that based upon what you have reviewed that you are more concerned today than you were in your previous study, is that a correct statement?

Mr. FULTZ. That is absolutely correct.

Mr. MENENDEZ. Let me ask you, do you know Dr. Edward Purvis, have you heard of him?

Mr. FULTZ. Personally, no, but I have heard of him, yes.

Mr. MENENDEZ. I understand that Dr. Purvis is the person who headed the Department of Energy's investigation of Cuba's reactors. And I assume that it is the Department of Energy who participated with you.

Did the Department of Energy participate with you in your review?

Mr. FULTZ. No, they did not.

Mr. MENENDEZ. Maybe it was with——

Mr. FULTZ. Perhaps NRC.

Mr. MENENDEZ. NRC.

Do you know Dr. Purvis?

Mr. FITZGERALD. Yes, I do.

Mr. MENENDEZ. He did, OK.

Dr. Purvis, I have a statement from him that says, "An accident in the Cuban VVER 440 is probable. It is just a question of when. I do not know if they are the most dangerous reactors in the world, but they are the most dangerous reactors anywhere close to the United States." And from what you tell me, it seems to me that his statements are very well substantiated.

You mentioned defective welds.

Can you tell the committee what a defective weld is, what it means, what if the significance of that?

Mr. FULTZ. I would have Dr. Fitzgerald, who is our nuclear engineer, respond to that. And I would also like to have him characterize his perceptions when he viewed the slides and the tape that we did. Because he has seen reactors all over the world, and I think that his views would be very enlightening also.

Mr. FITZGERALD. I will address the second part first. I have visited reactors under construction in a lot of different places, in the United States as well as in Yugoslavia, and in Brazil, and in the Philippines. And based on what I saw there, I had a kind of expectation of what I would see in the NBC film of the Juragua site.

Frankly, I was shocked to see what appeared to me to be an almost abandoned site. And the condition that was there was really surprising.

With respect to the defective welds, when a weld is done, it is expected to have strength, and strength is based on the weld being done properly. And one way to judge if it has been done properly is to take an x-ray of it, and see whether or not there are any defects that appear on the x-ray.

What we were told was that the welds were x-rayed, and found to have defects, which would mean that the weld was not as strong, as it was supposed to be when it was designed and done.

Mr. MENENDEZ. And what exactly, Doctor, for those of us who are not as well schooled, what is a weld, what does it do, does it provide support, what is it?

Mr. FITZGERALD. Pieces of piping arrive onsite separated. They are joined together by welding. The metal is melted, and the two pieces of pipe are joined by that method.

Mr. MENENDEZ. So when a weld is defective, it means that ultimately it has the potential of bursting or opening up?

Mr. FITZGERALD. The pipe would not do its job. If it is a pressure pipe, it has the potential for bursting and opening up.

Mr. MENENDEZ. And in doing so, what is the consequence of that?

Mr. FITZGERALD. If that pipe was one for example carrying water that is essential for cooling the reactor, it might lead to what would be a loss of water that could cool the reactor, and that might lead to damage to the reactor core itself.

Mr. MENENDEZ. So in essence, if in fact it is a water pipe and the welds are defective, and you are talking about 10 to 15 percent of those welds being defective, in essence the ability to cool down the reactor to stop it from getting it to temperatures that are explosive in nature it might very well be a cause of such a catastrophe?

Mr. FITZGERALD. If the defective welds were in a pipe that was carrying water that was essential for cooling the reactor, that would be true. But we do not know where those welds were.

Mr. MENENDEZ. But in any event if be they water pipes or welds at other locations, a weld is obviously an important structural part of any construction. It is obviously there in the first place to join something together. If it is defective, its ability to join whatever essential elements are together is in fact a cause for concern.

Mr. FITZGERALD. That is correct.

Mr. MENENDEZ. Now let me ask you, when your GAO report said that the possible inadequacy is the upper portion of the reactor's dome retention capability to withstand only 7 pounds of pressure per square inch, given that normal atmospheric pressure is 32 pounds per square inch, and U.S. reactors are designed to accommodate pressures of 50 pounds per square inch, what exactly does that mean to the layman?

Mr. FITZGERALD. The normal atmospheric pressure is 15 pounds per square inch. The seven pound number means in excess of atmospheric pressure. The U.S. containments are of a different design where all of the equipment is within the containment, it is a big room, and it is designed to take the entire pressure of a big steam leak.

The Juragua reactor or the Russian reactor is of a slightly different design. They have compartments below the dome that are designed for a higher pressure. You said 32 pounds. They are designed to carry 32 pounds. And then the steam goes in through the pressure/suppression system. And if it works properly, the pressure inside the containment according to their design calculations would not exceed 7 pounds.

Our concern is that that pressure/suppression system as far as we know has not been prototyped, or tested, or proven to be really workable. So the design may be OK, but we do not know that it will really work.

Mr. MENENDEZ. And if it is not workable, is it fair to say, to extrapolate from what you said as a layman, that when you do not have the capacity for greater pressure retention, that therefore the ability to withstand the pressure is lowered and creates the possibility of an explosion?

Mr. FITZGERALD. It creates the possibility that the containment which is designed to keep inside of it material would have an opening or a break or something, and the material would leak out. It does not necessarily mean that there would be an explosion.

Mr. MENENDEZ. I am sorry. That the pressure would generate an opening due to the lack, and therefore create a release?

Mr. FITZGERALD. Right.

Mr. MENENDEZ. And nothing has changed obviously from your last slide that was presented to you by the National Oceanic and Atmospheric Administration to suggest that if these defective welds be they structural in terms of the dome or that of a pipe that would carry water to cool down the system that would create such pressure which pressure is not within the sustaining process of the pressure that would be built up and would permit a release, that such a release could——whether it be summer or winter winds—carry it to the United States?

Mr. FULTZ. That is correct. In fact, we talked to their specialists as recently as yesterday. And in fact, the data which they gave us was used to develop the slide presentation that you saw here.

Mr. MENENDEZ. Thank you, Madam Chairlady. I have no further questions.

Ms. ROS-LEHTINEN. Thank you, Mr. Menendez.

There are supposedly 1,500 workers associated with this plant. What are those workers doing now?

Mr. FULTZ. Well, I am not sure what they are doing now. I would suggest that if what you saw on the slide presentation, and it is quite frankly, indicative of the entire plant, because we did view the entire 7½ minutes or 8 minutes footage of the plant, that the workers have not done in my opinion and Dr. Fitzgerald's opinion a very good job of maintaining or preserving this facility.

And it was striking quite frankly when we reviewed this footage that the absence of humans at this facility is almost frightening. We only saw perhaps two or three during the entire time. There was no evidence of vehicles, of trucks, or other equipment that would indicate people at the facility.

I have heard reports of 1,500 people. On the basis of what I have seen, I would have to say that is substantially less than that.

Ms. ROS-LEHTINEN. Chernobyl stands in our mind as a strategy of such epic proportions, and we still see the effects of it every day in the surrounding areas, that any type of accident compares itself to Chernobyl.

Understanding that the plants are dissimilar with different technology, just totally different plants, could you tell us if an accident were to take place in Juragua or a provoked incident, would the consequences of that accident or that incident compare to Chernobyl in terms of environmental damage, perhaps in not as great a proportion, but the damage, could it be compared to Chernobyl in any way?

Mr. FULTZ. I would say that it would be extremely difficult to make any comparisons today. Because one, the plant would have to be completed, and risk assessments and various models would have to be run. And it would be extremely difficult to do that without having those completed. And to our knowledge, there has been no risk assessment. There has been no models run to make those determinations.

So I would have to decline and say that I could not make that comparison at this point.

Ms. Ros-Lehtinen. I understand.

What are the potential environmental risks to the United States, to Central America, and to the Caribbean if these poorly designed and defectively constructed nuclear reactors begin operations in Cuba?

Mr. Fultz. Well, first of all, it would depend on the severity of an accident, if it were to occur, when the release from that accident were to be emitted into the atmosphere, and the concentrations and the types of radio nucleides would be emitted, the wind condition, the weather at the time. There are a lot of variables.

But there could be some significant damage to a rather large portion of the United States, the magnitude of which is unknown at this point.

Ms. Ros-Lehtinen. And we have been talking in all of this time about the Soviet supplied materials being defective. Some reports say 60 percent of those have been defective. And that former Soviet advisors have reportedly told Cuban officials that they could not guarantee that the valves that they installed in the first reactor's emergency cooling system would function under certain conditions.

What risks would these deficiencies pose if Cuba begins operation of these reactors?

Mr. Fultz. If those allegations are true, I would say that the safe operation of the plant would be extremely questionable. And it is possible that you could have incidents or accidents that would occur as a result of some of those deficiencies. And again, we have not seen reports, and we do not have access to that date to verify whether or not it is the 60 percent that we have also heard about.

Ms. Ros-Lehtinen. And we have seen it in your slide the constant exposure to tropical climate and the sea air.

What do you think has been the impact on these reactors by this exposure since the halting of construction eighteen months ago?

Mr. Fultz. Well, I would like to characterize Dr. Fitzgerald's comments to me when he viewed them. And he said that he was shocked at the deterioration that had occurred, the rusting that has occurred, the moss growing on the walls and so forth. It has potentially made a severe situation worse. And I would caution that we just do not know the impact of this deterioration. And it would probably take months of careful and detailed analysis to determine the actual impact or degradation that has occurred.

Ms. Ros-Lehtinen. Were you to be in the capacity of being able to advise President Clinton one on one on what he should do about this nuclear plant, what would be your advice to the administration?

Mr. Fultz. I would say that both Congress and the administration ought to exercise extreme caution in monitoring what is going on at this plant. And if the statements about bringing these plants on line are true, and if the assistance could somehow be given, I would say that the United States ought to be extremely careful, and make sure that the safety concerns that we and others have identified are addressed. And as to what is done after that, I think that is a policy question for the Congress and the administration to work out.

Ms. ROS-LEHTINEN. Well, we are certainly doing our part to highlight that and making sure that the plant is stopped before it becomes more of a threat to our likelihood.

And I would like to thank the panelists for being here. We have final passage on the Bosnian arms embargo. And before we excuse ourselves to go vote, I would like to introduce the next set of panelists.

Thank you very much, gentlemen.

Mr. FULTZ. You are welcome. Thank you.

Ms. ROS-LEHTINEN. We are now proud to have with us Dr. Pelayo Calante Garcia. Before he defected to the United States, he was technical assistant and quality inspector at the nuclear plant, and will provide us with a first-hand view. Welcome, Dr. Garcia.

And Roger Robinson is going to be joining us as well. He is well known to many of us from his National Security Council days during the Reagan administration. He is now president of RWR, Inc.

And Ann Winsor is going to be translating for Dr. Calante.

You may begin your statements, and then we are going to stop you in just a few minutes and go vote. And we will recess and come back. Dr. Calante.

STATEMENT OF DR. PELAYO CALANTE GARCIA, FORMER PROFESSOR, ADVANCED INSTITUTE FOR NUCLEAR SCIENCE AND TECHNOLOGY AS TRANSLATED BY ANN WINSOR

Mr. GARCIA. Mr. Chairman, I appreciate the opportunity to present my concerns about the construction of the Juragua nuclear power plant in Cuba. I was involved in the initial construction of the Juragua nuclear power plant from June 1984 to October 1991 when I left Cuba. I was responsible for quality inspections in the containment building. I will provide my resume for the record.

There are numberous problems concerning the construction and assembly of the Juragua nuclear power plant. The reactor containment structure, which is designed to prevent the accidental release of radioactive material into the atmosphere, contains defective welds in seals in the containment building and in support structures for the primary components such as the steam generators.

The system to reduce pressure in the containment building has not been tested. If this system fails, the containment building could be breached, and a radioactive release could occur.

There is no quality assurance system. For example, the welders are not certified and a poor work ethic which has resulted in many mistakes in welding equipment, piping, pumps, valves, and seals in the construction of the containment building.

Even though the plant has been seismically designed, the primary coolant system isolation valves and other valves in the primary circuit have not been certified to function under seismic conditions.

Training for the reactor operator has been inadequate. For example, the Juragua nuclear power plant is a VVER 440, Model V213, and the reactor operators were trained on a VVER 440, Model 230, which is an older Soviet designed reactor that has fewer safety systems.

Since 1987, the exposure of salt air has corroded safety equipment that has already been assembled such as pumps, valves, pipes, heat exchanger, and water tanks. Moreover, the nuclear reactor should be protected in a nitrogen atmosphere in order to avoid rusting. However, the reactor vessel has been exposed to the salt air in open form without any protection since late 1990. Rust on the reactor vessel can affect the integrity of welds and can cause weakening of the reactor vessel.

Mr. Chairman, this concludes my testimony. And I welcome any questions from the committee.

[The prepared statement of Mr. Garcia appears in the appendix.]

Ms. ROS-LEHTINEN. Thank you so much, Dr. Calante. If you will excuse us, Mr. Robinson, we are going to go vote, and we will be back.

The subcommittee is in recess.

[Recess.]

Ms. ROS-LEHTINEN. The subcommittee will once again come to order.

Thank you so much, Dr. Calante, for your very moving and eloquent testimony.

And now I would like to recognize Mr. Robinson for his opening statement. And then Mr. Menendez will chair the rest of the hearing.

Thank you, both of you, for being here with us today.

STATEMENT OF ROGER ROBINSON, PRESIDENT, RWR, INC.

Mr. ROBINSON. Thank you, Madam Chairman.

It is indeed a privilege to appear before the subcommittee on a pivotal issue on the relationship with Castro's Cuba, and the ultimate transition to a democratic Cuba, the Soviet designed Juragua nuclear complex near Cienfuegos sometimes referred as the Cienfuegos project.

Over the past decade, I have served as president and CEO of RWR, Inc., a Washington based consulting firm, and was formerly senior director for international economic affairs at the National Security Council under President Reagan.

Prior to my government service, I was a vice president in the international department of the Chase Manhattan Bank with responsibilities for Chase's loan portfolio in the Soviet Union, Eastern Europe, and Yugoslavia.

Since the American people first learned of the advance stage of construction of the first of two VVER 440 reactors in the spring of 1991, I have tried to monitor this portentous project and associated implications for our national security.

In my capacity as a member of the board of advisors of the Center for Security Policy, I coauthored several decision briefs published by the center from May 1991 until the time that the Cienfuegos project was reportedly mothballed in April 1992.

The bottom line concerning recent reports of the project's revival under the sponsorship and coordination of Moscow is simply this. The Juragua complex is even more frighteningly flawed and unacceptable today given the passage of time and corrosive exposure to the elements than it was some 3 years ago.

In my written testimony, I have attempted to provide the geopolitical and historical context in which this undertaking should be properly viewed. And I reiterate briefly the troubled history of the

Juragua complex, offer an analysis of the rationales of the various participants potentially involved in reviving this transaction, and make policy recommendations concerning how best to counter this burgeoning threat to U.S. national security interests.

As our time is somewhat restricted, I would like to concentrate on summarizing the key findings and recommendations embodied in my written testimony, which I would like to submit to the committee for the record of these hearings.

Mr. Chairman, at the outset, I would like to probe the question of why does the Cienfuegos project matter. As you know, the United States is today facing several simultaneous foreign policy challenges which risk distracting our attention from an impending threat to the territory of our Nation stemming from this irretrievably flawed nuclear complex.

I am persuaded, notwithstanding administration denials, that the Clinton team's propensity to seek "engagement" with authoritarian regimes as opposed to isolation and containment also applies to our Cuba policy.

Indeed, it appears that a Vietnam style road map for the incremental normalization of relations with Havana is in place. Castro and his associates are no doubt observing the cynical shortsighted United States and Western policies on display in the North Korean reactor pay-off scheme and the Russian/Iranian nuclear gambit, and concluding that the revival of this Cienfuegos project is a no lose proposition.

It is worth reminding the committee that this country faced a similar world class energy deal imperiling our security interests during the Reagan administration, the huge Siberian pipeline deal, which was successfully countered through decisive Presidential action.

The United States should be under no illusions concerning Havana's resolve to work with Russia as well as prospective European and Latin American partners to complete and fuel these VVER 440 reactors given the fact that the project's price tag is equivalent to roughly 2 years of Cuba's total hard currency export income.

Accordingly, the only way to avert continuing efforts to revive this project is to put a proverbial stake in the heart of this coming nuclear nightmare now.

It should be recognized that this Moscow sponsored Cuban nuclear deal is of a piece within energy related foreign policy dramas currently playing an increasingly dominant role in world politics.

Examples include the Russian invasion of Chechnya, which was in part to secure pipeline routes, Kremlin efforts to isolate Azerbaijan and Turkey, the escalating nuclear threat posed by Iran and North Korea, China's increasingly belligerent forays into the Spratly Islands, and Germany's insistence on acquiring a research reactor utilizing highly enriched weapons grade uranium.

To preserve the credibility of U.S. anti-proliferation efforts and the message to our allies and potential adversaries that we mean business on ensuring the safe benign global development of nuclear energy, it is essential that we view the Cienfuegos nuclear project as a litmus test of American political will for the twenty-first century.

Mr. Chairman, I have offered in my written testimony a litany of reasons why virtually everything about this reactor deal is dangerous from a technical perspective and why no "fixes" will be able to remove this unacceptable risk to the American mainland.

Naturally, I would be pleased to discuss the myriad of technical problems and Cuba's inadequate human and technological infrastructure in the question and answer period.

This estimated $2.0 to $2.4 billion project is well beyond the indigenous capabilities of a destitute Cuba, and would require large scale financing and components from a European and Latin American suppliers and Russia to be realized.

Efforts by Russian's ministry of atomic energy, MINITOM, to syndicate the required financing to complete the project through a consortium of European and Latin American suppliers with their respective governments likely underwriting 100 percent of the otherwise untenable commercial and political risk associated with this deal are likewise described in my expanded remarks for the record.

In addition, an analysis is provided of the perceived political and economic benefits accruing to Moscow and prospective European and Latin American suppliers from the project being brought on line.

Finally in this section, the apparent silence of the world environmental community to the revival of Juragua is noted and a possible political explanation is provided.

In conclusion, our Nation is now forced to decide if the Cienfuegos project is to serve as a case study of how to shorten the life of tyrannical regimes which denied basic human liberties. In short, is our policy toward Cuba to be one of engagement and expanding western life support to isolation and bail-out avoidance.

Castro is likely calculating as a minimal fall-back position that the presence of this profound new danger off our shores will ultimately result in U.S. "engagement" advocates rushing forward with a proposal to "make the reactor safe," and take advantage of this important new "window of bilateral cooperation".

Thus far, he has probably been encouraged that yet another Clinton administration reactor buy-off gambit is in process. It will probably be up to the Congress to prove him dead wrong.

Simply put, what the beleaguered Cuban people need now is to have the Castro government put out of business, not given a new taxpayer-financed lease on life.

With some twenty or more countries actively seeking to acquire weapons of mass destruction and ballistic missile delivery capabilities, it is an unaffordable luxury to respect such strongly supported features of the international trading system as contract sanctity and the avoidance of extraterritoriality, unilateralism, and import controls in circumstances of overriding peril to our Nation's fundamental security interests.

Like Conoco's ill fated Iranian venture, this project represents such a circumstance. Accordingly, those European and Latin American companies and financial institutions working to advance completion of the project should be subject to swift and decisive penalties from the Congress. U.S. import controls should probably be the sanction of choice for private sector western entities supplying Juragua, requiring a decision by the management of these firms between doing business in the American market or the Cuban market.

Western governments choosing to backstop their companies and banks should have more than one bilateral priority put at risk by the Congress, if the executive branch fails to demonstrate adequate resolve.

In the case of the Russian government and MINITOM, the $12 billion dollar U.S.-Russian uranium deal underway may need to be reexamined and if necessary suspended contingent on MINITOM's handling of this Cuban reactor deal. Other bilateral initiatives in the energy area, such as U.S. EXIM Bank and OPIC's, the Overseas Private Investment Corporation, financing, guaranties, and insurance coverage to support Russian oil and gas production should likewise be put at risk by the Congress pending Moscow's immediate disengagement from this prospective Cuban Chernobyl.

Any attempts by Russia or other governments to fuel these reactors if completed should be interdicted by the United States by any means deemed necessary.

In closing, Congress should demand that Russia's announced intentions to complete the Juragua nuclear complex be placed at or near the top of the agenda of the next session of the Gore-Chernomyrdin Commission. Indeed, the absence of this agenda item ought to be viewed with profound concern.

Finally, all of the Presidential candidates should in the course of their respective 1996 campaigns pledge to the American people that they will not permit through announced disincentives from Moscow and allied firms, or failing that direct interdiction, the fatally flawed nuclear reactor complex at Cienfuegos to be completed, fueled, and brought on line, at least not on their watch.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Robinson appears in the appendix.]

Mr. MENENDEZ. [presiding] Thank you, Mr. Robinson.

Let me say that I am constrained not to ask unanimous consent to do about anything that I want to do on the committee at this time. It is a very unique role. But I know that to keep the chairman's confidence, I will not do that, but it is unique to be in the minority and chairing at the moment. But I take that as an appreciation of the confidence that the chairman has in our mutual interest in this regard.

Dr. Calante, let me first welcome you to the United States and to freedom.

You in your testimony said that you worked and were responsible for quality inspections in the containment building?

Mr. GARCIA. Yes, sir.

Mr. MENENDEZ. And you did that from 1984 to October 1991 when you left Cuba?

Mr. GARCIA. No, not really. I was involved in the construction from 1984 to 1991. I did several inspections during this period of time, because I worked in Havana as professor at the Advanced Institute for Nuclear Technology and Science. Since I taught a course of construction and assembly of nuclear power plants, I was not at the Juragua Power Plant all of the time. For this reason, the Secretariat of Nuclear Affairs in Cuba asked me for assistance.

Each time I was in Juragua, I made an inspection of different areas for quality control for the Secretariat of Nuclear Affairs.

Mr. MENENDEZ. So there were times that you conducted quality control inspection?

Mr. GARCIA. Yes, full-time from 1987, September to December. In the morning, I taught and in the afternoon, I worked at different tasks at the office of the nuclear quality control.

Mr. MENENDEZ. And basically, what your testimony is is confirmation of what the GAO, the witnesses who were here before you, said, which is that the reactor's containment structure designed to prevent the accidental release of radioactive material into the atmosphere contains defective welds in the seal structures.

And you went on in that respect to talk about that there are other concerns for welders who are not certified which may have resulted in mistakes in piping, pumps, valves, and seals in the construction of the containment building, is that correct?

Mr. GARCIA. Yes, sir. The main problem is that the construction of the power plant is divided into two companies: the construction company and the investment company. The investment company has to do all of the quality control for the construction work. But the department of quality control is in the construction company. For this reason, after they made some mistakes, it is very uncomfortable for the quality control and they do not say anything to the investment divison.

Mr. MENENDEZ. Let me stop you there.

What you are saying is that when these items were brought to the construction company's attention, that they did not want to say anything to the investment company, so that the investments would not stop?

Mr. GARCIA. Correct. The investment company already has one department for quality control, but there were very few inspectors. And they only put it some place and made the inspection. The main inspection was done by the construction company. The quality control department is in the construction company. The person who did the work was them. There was only one person in this company.

Mr. MENENDEZ. The interest of the construction company in—obviously was not being as forthcoming as possible—was their concern that the money would stop, and therefore their work would stop?

Mr. GARCIA. Of course. They have to make the money for the finished work.

Mr. MENENDEZ. Let me ask you. This statement that I read to the record before by Dr. Purvis—who I understand is here in the audience, I did not know that before, welcome—where he said that, "An accident in the Cuba VVER 440 is probable, and is just a question of when. I do not know if they are the most dangerous reactors in the world, but they are the most dangerous reactors anywhere close to the United States," do you believe that in your own professional expertise to be true?

Mr. GARCIA. Yes.

Mr. MENENDEZ. You believe that to be true?

Mr. GARCIA. Yes.

Mr. MENENDEZ. Mr. Robinson, let me ask you. I was reading along as you were making your statement in looking at areas that you did not cover, because of the limitation of time.

What should we clearly be doing—first of all, let me ask you about your view of the previous testimony of Mr. Stratford.

Do you believe that it is so far-fetched that in view of your previous work with the National Security Council under President Reagan, do you believe that it is so far-fetched to be able to draw the money together to finish at least the first nuclear reactor that is about $300 million short?

Mr. ROBINSON. No, I do not. I think that it is feasible, Mr. Chairman. I tried to underscore in my written testimony, but also mentioned it in our oral remarks today, that these otherwise untenable credit risks, Cuba being the worst credit rating in the world according to "Euro Money" in 1994, that would normally prevent the ability to raise a consortium or syndication as we say in the banking business of this kind and the necessary financing to complete Reactor 1, and possibly even both reactors, is offset by the fact that typically the European governments, and I even suspect Latin American governments if it comes down to a Brazilian supply relationship for example, have export support programs that are used very liberally, well beyond the way that we use our EXIM Bank, and would underwrite via European taxpayers virtually a hundred percent of the amount of the export with a profit margin, so that these companies, the suppliers, whether it is a Siemens or anyone else, would really only look to the credit risk of the German government in that case, because they are completely covered.

So this is going to turn out to be heavy government involvement among our allies both in this hemisphere and in Europe if indeed this goes forward. And I would think that it is very feasible to raise the money under those circumstances.

In fact, I also happen to agree with your earlier remark. That as a former international banker that I can tell you for certain that no one is going to announce their participation and decision to participate in a consortium or syndicate of this kind until it has reached such a mature point that the likely success is fairly well assured.

Therefore, when our representative from the State Department made clear that no decisions had been made by prospective suppliers in Europe and Latin American, I had frankly the same reaction that you did. That does not indicate in my mind to the slightest degree what ultimately may be at work here, and an internal corporate decisionmaking process that may well be further along with implicit sweetheart understandings with their respective governments that frankly we know nothing about as the State Department and others go around making demarches around the world to foreign governments and prospective suppliers.

Mr. MENENDEZ. A last question then.

Do you not see the demand for power in Cuba growing, and as such if we already see the difficulty in the trading capacity of Cuba, because it does not produce very much these days, clearly there will continue to be a demand by the investors, and will that not itself almost be the wherewithal by which the investors seek, that the potential investors seek to invest, in order to meet the very needs of their creating through their other investments?

And we recognize that several of the countries that have been mentioned as part of the stock group in fact are the countries that you will see various forms of investment going on in Cuba in other fields.

Clearly, it would seem to me, and I am wondering from your perspective from both formerly with the National Security Council and with an international financing background, is it not going to be almost a self-fulfilling prophecy that if you are going to make these investments and you need the energy for it that you are never going to build tourism unless you can guarantee it, and you are not going to have blackouts; are you not going to ultimately need the energy; and therefore is it not a way of protecting your own investments that you are making?

Mr. ROBINSON. I believe, Mr. Chairman, that one does drive the other most of the time. I have seen reports, as you probably have, that the electricity generated by the Cienfuegos project would definitely be used by the burgeoning tourist industry, as well as mining concerns, and other sectors of the Cuban economy that have had to date the most success in attracting foreign direct investment.

It is likewise true that as those infrastructure requirements expand that the dearth of electrical generating power becomes an enormous constraint.

Europe is interested in establishing national export beachheads in Cuba, in Castro's Cuba. Not all European countries, but several, certainly the ones that we have mentioned.

So they are taking the long view, and they want that kind of infrastructure in place. And I very much think that they believe that it is going to prime the pump for expanded export potential out of those respective supplier countries, and hence why their respective governments are likely to step up and back stop them to the tune of 100 percent with taxpayer underwritten credit guarantees and insurance coverage.

Mr. MENENDEZ. Well, I want to thank you for your contributions. And Dr. Calante, for your contributions as well, which only go to verify what the GAO report said. And from a firsthand perspective, we certainly hope that today's hearings and all of your respective testimony is such that will awaken those who think that this might just be a fictional concern, when in fact we believe that it is a serious concern.

It is a serious concern to the people of Cuba. And it is a serious concern for 80 million Americans, who would be part of that plume and would be affected should there by an accident. And it is a serious concern to a significant part of the Caribbean and Latin America. And we hope that today's hearings will send a message to the administration that their concerns should be equally heightened.

Thank you very much. And the committee stands adjourned.

[Whereupon, at 5:17 p.m., the subcommittee was adjourned to reconvene at the call of the chair.]

APPENDIX

Statement of the Hon. Robert Menendez (D-NJ) Western Hemisphere Subcommittee Hearing on the Nuclear Plant near Cienfuegos, Cuba

August 1, 1995

Mr. Chairman, I commend you for holding this hearing, given the urgency of this issue. Russia and Cuba have announced a joint stock company to finish construction of a dangerous nuclear plant located in the southern coast of Cuba. In June, the House passed an amendment I offered along with my colleagues, Ms. Ros-Lehtinen, Mr. Diaz-Balart, and Mr. Deutsch to reduce dollar-for-dollar U.S. aid to any country which financially helps the Castro dictatorship build a nuclear plant. And in July, the House International Relations Committee passed a similar amendment to H.R. 927, the Cuban Liberty and Democratic Solidarity (LIBERTAD) Act, which you sponsored, Mr. Chairman. So, Congress has spoken clearly on this issue.

Yet, the Castro dictatorship has decided that a dangerous and mothballed Soviet-era nuclear plant in Juragua, near Cienfuegos, Cuba should be completed and operated. Well, we believe that it should not. Let me explain why not, in some detail:

In a letter to me dated April 12, 1993 President Clinton stated that "the United States opposes the construction of the Juragua nuclear power plant because of our concerns about Cuba's ability to ensure the safe operation of the facility and because of Cuba's refusal to sign the Nuclear Non-Proliferation Treaty or ratify the Treaty of Tlatelolco."

In fact, Cuba has yet to ratify either treaty -- the latter of which establishes Latin America and the Caribbean as a nuclear weapons-free zone;

The State Department, the Nuclear Regulatory Commission, and the Department of Energy also have expressed concerns about the construction and operation of Cuba's proposed nuclear reactors;

Dr. Edward Purvis who headed the Department of Energy's investigation of Cuba's reactors, stated: "An accident in [the Cuban VVER-440] is probable. It's just a question of when ... I don't know if they are the most dangerous reactors in the world, but they are the most dangerous reactors anywhere close to the United States."

In a September 1992 report to Congress, the General Accounting Office (GAO) outlined concerns among nuclear energy experts about deficiencies in the Cienfuegos nuclear plant project, including:

0 a lack in Cuba both of a nuclear regulatory scheme and an adequate infrastructure to ensure the plant's safe operation and maintenance, and inadequate training of plant operators;

0 reports by a former technician from Cuba who, by examining with X-Rays weld sites believed to be part of the auxiliary plumbing system for the plant, found that 10 to 15 percent of those were defective. This technician, Mr. Jose Oro, was quoted recently as saying, "The operation of this reactor will be criminal. The construction was being performed in a completely negligent manner."

0 since September 5, 1992, when construction was halted, there has been prolonged exposure to the elements of the primary reactor components, including corrosive salt water vapor;

0 The possible inadequacy of the upper portion of the reactors' dome retention capability to withstand only 7 pounds of pressure per square inch, given that normal atmospheric pressure is 32 pounds per square inch and that United States reactors are designed to accommodate pressures of 50 pounds per square inch.

0 Also, according to the U.S. Geological Survey, the Caribbean plate, a geological formation near the south coast of Cuba, may pose seismic risks to Cuba and the reactor site, and may produce large to moderate earthquakes. In fact, on May 25, 1992 the Caribbean plate produced an earthquake numbering 7.0 on the Richter scale;

Now, if you are from Texas, Louisiana, Arkansas, Mississippi, Alabama, Florida, Georgia, Tennessee, South Carolina, North Carolina, Maryland, Virginia, and Washington, D.C., please be warned. We are talking about 80 million Americans here, Mr. Chairman -- almost one in three Americans. According to a study by the National Oceanic and Atmospheric Administration (NOAA), summer winds could carry radioactive pollutants from a nuclear accident at the power plant throughout all of Florida and parts of the states on the gulf coast as far as Texas, and northern winds could carry the pollutants as far northeast as Virginia and Washington, D.C. Many more states would be affected in time.

Finally, Mr. Chairman, Fidel Castro over the years has consistently issued threats against the United States Government. In 1962, he advocated the Soviets' launching of nuclear missiles to the U.S. and brought the world to the brink of a nuclear conflict.

We are talking about perhaps the most Anti-American dictator in the world. Can we trust him with nuclear power? Can we trust him with an unsafe nuclear plant? Do we need another Chernobyl-type incident 90 miles from the U.S.? I strongly suggest not, as do at least 132 of our colleagues who wrote to President Clinton, urging him to do everything possible to stop the nuclear plant and the threat it poses.

We should not permit any U.S. tax dollars to help those who would put our country and our fellow citizens at such risk.

PETER DEUTSCH
20th District, Florida

COMMITTEE ON COMMERCE

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AND ENVIRONMENT

SUBCOMMITTEE ON ENERGY
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Statement of Congressman Peter Deutsch
In the House of Representatives
8/1/95

Mr. Chairman, I want to thank you and the other members of the Western Hemisphere Subcommittee for allowing me to testify today. I commend your leadership on this issue and congratulate this committee for its strong effort in opposing this nuclear disaster. Before this year's debate on Foreign Operations Appropriations bill, many Members had never heard of the Juragua Nuclear Facility. Because of the efforts of this committee and other members, now they have heard.

My district is 90 miles from Havana, Cuba. When your are in Key West, the southernmost part of my district, you are closer to Havana then your are to Miami. The proposed site of this nuclear reactor is under 200 miles from Key West. This is a very real; local concern for my constituents; not a vague foreign policy issue. I am here today to voice my strong opposition to the construction of this nuclear reactor. I am also here to voice my strong support for further U.S. efforts to prevent this nuclear time bomb.

The tragedy of Chernobyl should be a potent reminder. In 1986, the Soviet nuclear reactor at Chernobyl exploded spreading radioactivity across thousands of miles. The radiation has caused enormous destruction to the people and environment of the surrounding area. According to a recent *Washington Post* article, over 2 million Belarussians were exposed to high radiation levels after the accident. Since the accident, cancer rates in children under 14 have increased by 4100%.

Now the Russians are building a similar type of reactor less than 200 miles from the United States coast. Over 3.2 million people live in the three counties in Florida that I represent and over 650,000 of these lives are children. The loss of life from an accident in Cienfuegos would be unimaginable. In two days, radiation would reach as far north as Virginia, contaminating people, and destroying crops, livestock, and water in its path.

In addition to the tragic loss of lives, the destruction to the environment would be irreparable. I, along with Ms. Ros-Lehtinen, have fought to preserve South Florida's fragile ecosystem. The release of large amounts of radiation from the plant would contaminate the entire Southern coast of the United States. It would be the largest environmental disaster in the history of the world. We cannot allow the Russians to help Castro fulfill his dangerous goal. In the Foreign Operations Appropriation this year, the House of Representatives sent a strong warning to Russia, Cuba and the international community that the U.S. will not tolerate unsafe and unsupervised nuclear facilities near our shore.

Mr. Chairman, under your leadership, this committee has done an incredible job educating this Congress, about both the danger of this nuclear reactor and the danger of Fidel Castro. But our work is not done. We cannot rest until the Congress and the United States government have done everything possible to the stop the construction of the reactor. We must not rest until the Cuban people are free from Castro's tyranny. Again Mr. Chairman, thank you for the opportunity to share my views.

PRINTED ON RECYCLED PAPER

18th District • Florida

News Release

Congresswoman

Ileana Ros-Lehtinen

2440 RAYBURN BUILDING • WASHINGTON, DC 20515•202/225-3931

Statement by Congresswoman Ileana Ros-Lehtinen Before The Subcommittee On The Western Hemisphere Hearing On The Juragua Nuclear Power Plant (8/1/95)

Thank you, Mr. Chairman. Today, our subcommittee holds what is arguably one of the most pressing hearings of the year for it deals with a grave security threat to the United States- the Juragua nuclear power plant in Cuba.

Mr. Chairman, the completion of the Juragua nuclear plant would represent the introduction of a real and present threat to the national security of the United States. Former technicians who worked at the plant, as well as experts on the issue have stated the grave concerns about the deficient construction of the plant and of the inferior materials used to build it. These experts and technicians have detailed dangerous deficiencies in the plant's construction which could lead to a nuclear accident which will likely affect Central America, the Caribbean, the United States, and of course, Cuba itself.

Among the more worrisome details which have emerged are the high percentage of pipe welding which X-ray tests have proven to be deficient; the lack of technical ability in Cuba to maintain such a plant; the lack of an infrastructure in Cuba to operate a nuclear facility; the low pressure threshold of the reactors containment dome; and other defects.

Some have expressed doubts about the credibility of the announcement made last May 4th where Russian and American officials announced the creation of a multinational consortium to finance the estimated $800 million dollar to complete the two reactors which compose the Juragua nuclear plant. In that announcement, various companies: Siemens of Germany, Ansaldo of Italy, Electricite de France, along with a Brazilian and British firm where mentioned as being involved in the proposed project. Indeed, just two weeks ago, press reports from Brazil indicated that a company from that country based in Rio de Janeiro, MPE, had visited Russia to finalize the deal that will reinitiate construction of the plant.

Moreover, over the last few months the state controlled media in Cuba has reiterated the intention of the Castro regime to complete the plant and has in various instances mentioned Siemens of Germany as a Western firm which will provide Castro with much of the equipment to complete the plant, mainly the plant's control system.

There is no doubt, Mr. Chairman, that Castro plans to complete this plant and finish it as soon as possible. The main motive for Castro to complete the plant is the same motive that drives him for much of what he does- his relentless pursuit to maintain absolute power over the island and its people.Juragua is part of Castro's plan to supplant nuclear power, for oil, as the regime's main source of energy. Juragua will offer this energy to the tourism industry which is a principal way through which Castro receives foreign exchange to maintain his regime.
So once again, the Cuban people's lives will be put at risk and sacrificed in order to satisfy the ego and desire for total power of Castro and his communist associates.

A troublesome phenomena which has once again emerged from the Juragua issue is the silence which the Clinton Administration has kept on this issue. While the President's Cuban advisers are quick to issue threats against those in the exile community who fight for the liberation of Cuba, a loud silence can be heard from the White House on this critical and important issue to the national security of the United States.

This week, I received a response from the President to a cosigned letter which 131 of our colleagues signed, including most members of this Subcommittee, urging the President to take strong action to halt the completion of the Juragua plant. Unfortunately, the President's response was weak and offered no clue of a strong commitment from the Administration to tackle this important issue.

Mr. Chairman, the message from the United States to Castro should be clear. The United States will not tolerate under any circumstances the operation of the Juragua nuclear power plant in Cuba. Sufficient evidence exist to believe with certainty that this plant, if completed, would be a national security threat to the United States.

Thus, the only solution to the Juragua plant problem is to destroy it in its totality. Modifications are not enough for the defects are hidden beneath mounts of concrete. Total elimination of the plant is the only solution. Unfortunately, this strong and stern message is not likely to emerge from the White House because the Juragua nuclear power plant, and the threat it poses to the United States, is a magnificent obstacle on the reconciliation path that the administration is taking toward the Castro regime.

Mr. Chairman, the bottom line is that the United States cannot allow that this plant be completed. It should be made clear to Castro that a national security threat, just 180 miles from our shores, will not be tolerated. The Juragua nuclear plant is a symbol of Castro's endless pursuit to maintain power and introduce new dangers to the Hemisphere. It also serves as a measurement of the commitment of the Administration to face up to the Cuban tyrant, of its support for the Cuban people, and of its defense of the US national security.

THE WHITE HOUSE
WASHINGTON

July 24, 1995

Dear Representative Ros-Lehtinen:

Thank you for your letter expressing concern about the potential safety hazards posed by the possible completion of the Juragua nuclear power plant.

The U.S. Government has monitored the Juragua project closely since construction began in 1983. We have repeatedly stated our objections to completion of the facility. I remain concerned about the Cuban Government's failure to commit to comprehensive safeguards; it has signed but not yet ratified the Treaty of Tlatelolco, and it has not negotiated a full-scope safeguards agreement with the IAEA. We also have serious questions about the quality of the plant's construction -- underscored by testimony by emigres with firsthand knowledge -- and Cuba's ability to operate it safely. Possible deterioration of the facility since construction was abruptly suspended in 1992 has compounded these problems.

We have made our concerns known to Moscow on many occasions. Although the former Soviet Union in 1986 pledged that the facility would meet international safety standards and include proper containment, we have continued to press Moscow to address our concerns about the facility. As recently as June 22, we urged Russia not to move ahead with the project. We have also voiced our concerns to the governments of countries that might supply the equipment needed to complete the reactor.

I assure you that we will continue to give this issue the high priority it warrants.

Sincerely,

Bill Clinton

The Honorable Ileana Ros-Lehtinen
House of Representatives
Washington, D.C. 20515

Statement of

Richard J.K. Stratford
Director
Office of Nuclear Energy Affairs
U.S. Department of State

before the

Subcommittee on the Western Hemisphere
of the
Committee on International Relations
U.S. House of Representatives

August 1, 1995

Mr. Chairman:

Thank you for the opportunity to appear before the subcommittee. Today, I would like to address briefly the status of the Russian-supplied reactors which have been under construction in Cuba, our best understanding of the safety concerns raised by that project, and some of the steps we have taken to try to resolve those concerns over the years.

To begin, let me briefly review the history of the project. In 1976, the then-Soviet Union and Cuba concluded an agreement to build two pressurized water reactors near Cienfuegos, on the south central coast of Cuba. This facility is also referred to as the Juragua project. Construction of the units, which began in 1983, was a high priority for Cuba because it sought to reduce its heavy dependence on imported oil. At the time, Cuba estimated it needed 3000 Megawatts (MW) of electrical generation capacity by the end of the decade.

Even in the early years of the project, there was a great deal of interest on our part in Cuba's ability to develop the infrastructure necessary to construct and safely operate a nuclear power plant. In order to learn more about the developing Cuban nuclear program, the State Department supported a visit to Cuba by officials of Duke Power, visiting on behalf of the World Association of Nuclear Operators (WANO), accompanied by a senior official of the U.S. Nuclear Regulatory Commission. I'll say more about that visit in a minute.

In September 1992, construction was halted because Cuba could not meet new Russian financial terms, which apparently stipulated that further work would have to be reimbursed via payment in convertible currency. Our understanding is that in November 1992, Cuba and Russia agreed to resume construction on the plant on the condition that a third partner be found to supply additional safety and instrumentation equipment and to help finance the project. That condition was apparently not met, and in 1993 Russia reportedly extended a $30 million credit line to Cuba for the mothballing of the plant.

We have made known our safety and safeguards-related concerns repeatedly to the governments of countries in which potential suppliers are located, and have gained assurances from those governments that licenses will not be issued for the export to Cuba of equipment for Cuba's nuclear energy program until Cuba has undertaken a comprehensive nuclear safeguards commitment. We also relayed our concerns to the Russian Government as recently as June 1995 and asked that the GOR not participate in completing the plant.

Present Status of the Reactors

Estimates vary as to the cost of completing both reactors, but at the high end they range well over a billion dollars. Civil construction (e.g. floors and walls) of the first reactor is believed to be about 90-97% complete. The civil construction of the second reactor unit is only about 20-30% complete.

Unit 1, however, is nowhere near operation. Our understanding is that only about 40% of the reactor equipment (e.g. pipes, pumps and motors) has been installed. Moreover, Unit 1's instrumentation and control system has not been purchased because Cuba does not have the hard currency to pay for it. Primary system components for Unit 1 (e.g. the reactor vessel, 6 steam generators, 5 primary coolant pumps, 12 isolation valves, 1 pressurizer and catch tank and 4 accumulators) have been delivered but not installed. These components have been stored outside on-site since December 1990. The reactor fuel has not been delivered. We understand that completing Unit 1 would require an investment of at least $300 million, perhaps considerably more.

Foreign Participation

The press has reported that Italian and Brazilian firms are working with Cuba and Russia on a comprehensive feasibility study of Juragua. Although reports have noted that Cuba and Russia hope to form a consortium with Western firms to complete construction of the plant, we do not believe that any Western company has as yet committed to participating in the project. Given Cuba's dire economic situation, financing for the project remains a serious obstacle to completion. Following what was reportedly the worst sugar crop in nearly fifty years, the Cuban government has little with which to barter and the Russian government has not indicated it will accept anything other than payment in hard currency.

Technical Aspects of the Project

I would now like to turn to a technical description of the Juragua nuclear reactors, but I begin with the following caveat. Juragua is the only plant of its kind. As a result, technical details and information about operating experience are not well established. However, the 1989 Nuclear Regulatory Commission (NRC) study, which drew heavily on open sources, and the NRC/Duke Power visit have yielded some preliminary information.

The plant consists of two VVER-440 Model V318 units, a variation of the earlier VVER-440 Model V213, a Soviet-designed pressurized water reactor (PWR). Each unit is located inside its own reactor building contiguous with its adjacent turbine building.

The VVER-440 Model V318 (which was planned to be exported to other countries outside the FSU) differs from the VVER-440 Model V213 mainly in that it has a steel-lined reinforced concrete containment structure. Although outwardly similar in size and design to the full containment structures used in the VVER-1000 design (which is commonly regarded by Western experts as the most safe of the Soviet-designed nuclear power plants), the Juragua containment building is actually divided into two separate zones, upper and lower, which use different passive systems to contain the high pressures and temperatures that occur during a nuclear accident. The lower zone uses a variation of the bubbler/condenser system found on V213 reactors; the upper zone relies on large volume and a passive spray system. (A bubbler/condenser system directs steam from the lower reactor compartments to water trays where the steam is condensed. A passive spray system uses gravity and siphoning to move water to the water spray heads, located at the top of the reactor compartment, which then spray the interior of the reactor compartment. Both systems are used to relieve overpressure in the reactor compartment.)

The result of the two-zone system is that while the lower zone is designed to accommodate a maximum overpressure of 1.5 atmospheres, the upper zone can only accommodate a maximum overpressure of 0.5 atmospheres. In both cases, this is considerably less than the four atmospheres overpressure that can be accommodated by the VVER-1000 containment building, a value comparable to Western designs. This has been identified by NRC and DOE officials as cause for concern at the site, even if the structures were constructed as designed.

Safety Concerns

The Model V213, upon which the Model V318 is based, is viewed by Western experts as safer than older generation Soviet-designed pressurized water reactors (PWRs) and safer than the graphite-moderated Chernobyl-type design operated in the Former Soviet Union and Eastern Europe. At this point, Mr. Chairman, let me make clear that NRC has not made a final determination of the safety of these reactors and that it is in no position to do so. The reports NRC has prepared on the design of these reactors are based on limited information, and NRC notes that reactor safety involves far more than just design issues. Nevertheless, NRC and DOE have concerns about the ability of Cuba's infrastructure to support the nuclear power program, including lack of an independent regulatory body, inadequate training for reactor operators, lack of safety standards, questionable quality of civil construction, and the design of the reactors' containment structure.

In contrast, countries currently operating VVER/440-V213 reactors in the New Independent States (NIS) and Eastern Europe have significant elements of nuclear infrastructures, operational experience, experienced regulatory bodies and have taken steps to update their nuclear laws. Countries operating VVER/440-V213s include Russia, Ukraine, the Czech Republic, the Slovak Republic, and Hungary.

Additional safety concerns have been raised by former Cuban nuclear power and electrical engineers who have emigrated to the United States. These concerns were set forth in a September 1992 report by the General Accounting Office (GAO), as well as in a 1991 hearing in front of this subcommittee. To summarize, Cuban emigres have stated that Cuba's nuclear power program suffers from inadequate training for reactor operators, and from poor construction practices. There were allegations that defective welds were found in the reactor's containment structure, in hermetic seals, in support structures for the primary components, in the spent fuel cooling system, and possibly in the auxiliary plumbing system. Although some of these defective welds were reported and confirmed, we understand that construction apparently continued unabated.

In March, 1989, the NRC produced a report comparing U.S.-designed PWRs to the Juragua design. The report evaluated various features of both designs on a technically objective basis, highlighting various safety shortcomings and deficiencies in the Model V318. As the NRC study notes, all inferences about the reactor design or other safety concerns must be viewed as tentative; the study was based on limited information. Data for the study were obtained through a limited survey of the available open literature. The focus of the NRC review was upon identification of any significant design features of the Model V318 which might have substantial safety significance. It did not, however, evaluate the safety of the Cuban units but merely consulted published technical information.

For example, the report notes that Model V213 reactors, and, by extension, V318 reactors, are susceptible to reactor pressure vessel embrittlement because of the high copper content of the steel and because of phosphorus impurities. These factors cause the material to become embrittled faster than expected, with an accompanying loss of ductility at low temperatures. As ductility is reduced, a rapid increase in pressure under certain conditions could cause the reactor pressure vessel to burst. Embrittlement and ductility reductions typically occur only after the units have operated for roughly seven to ten years.

In addition, in Model V213 and V318 reactors, the circumference of the reactor pressure vessel is small, and the wall of the vessel is therefore close to the reactor core. This increases the frequency of neutron bombardment of the vessel which, in turn, accelerates the embrittlement process.

Diplomatic and Technical Discussions

We have followed the development of the Juragua project closely since construction began in 1983. In the mid-1980s, we engaged the Soviet Union in a dialogue about the design and construction of the facility and asked the Soviet Union to review specific safety concerns raised by two Cuban emigres. Because of the scarcity of information about the state of construction at the plant and its design and because of safety concerns about other Soviet-designed reactors, the Department of State supported a visit to Cuba by government and private representatives in October, 1989.

On October 18-21, 1989, representatives from Duke Power, visiting on behalf of the World Association of Nuclear Operators, accompanied by a senior official of the NRC, visited the Juragua plant. That trip, while inconclusive, yielded some information about additions, upgrades and other equipment added to this design. Detailed information about engineering and safety modifications, as well as qualifications of plant personnel, is still lacking.

We have also supported efforts by the International Atomic Energy Agency (IAEA) to address safety concerns and construction quality at the facility. The IAEA initiated a limited technical cooperation program during the construction phase at Juragua which included development of a Probabilistic Safety Assessment (PSA) capability. The first project was funded and implemented by Spain. No equipment was provided through this program. When construction was halted at the site, we understand that the IAEA stopped providing assistance for PSA development but that Spain provided limited help to keep the plant protected during the period of inactivity. In 1994, the IAEA requested that Cuba prepare a comparison of the older V213 model and the Juragua-adapted design, which was subsequently delivered to the IAEA.

I should note the Administration does not have proliferation concerns regarding the Cuban nuclear program. However, we do feel strongly that sales or assistance to the Cuban nuclear program should not be provided until Cuba has undertaken a legally binding nonproliferation commitment. This may take place shortly. The GOC signed the Treaty of Tlatelolco in March of 1995 and may conclude the ratification process within the next few months. The next step following ratification would be to conclude an agreement with the IAEA providing for the application of international safeguards to all nuclear material in Cuba. Until full-scope IAEA safeguards are in place, the members of the Nuclear Suppliers Group (NSG), who constitute the great majority of the world's nuclear suppliers, are committed under the NSG Guidelines not to assist the Cuban nuclear power program.

Conclusion

In closing, let me say that our understanding is that Russia and Cuba would like to complete the project. However, as I indicated, financial assistance from the West is not likely to be forthcoming, and the odds of Cuba obtaining the necessary financing would seem to be low. We understand and share the concerns about safety that have been raised. We fully intend to keep a close eye on the developments at Juragua, and will continue to press Russia and others not to complete the project so long as we feel that the plant would constitute a danger to health and safety.

Thank you, Mr. Chairman.

United States General Accounting Office

GAO

Testimony

Before the Subcommittee on the Western Hemisphere,
Committee on International Relations,
House of Representatives

For Release on Delivery
Expected at
3:00 p.m. EDT
Tuesday
August 1, 1995

NUCLEAR SAFETY

Concerns With the Nuclear Power Reactors in Cuba

Statement of Keith O. Fultz,
Assistant Comptroller General,
Resources, Community, and Economic
Development Division

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to testify on our report that discussed concerns about the construction of the two Soviet-designed nuclear power reactors in Cuba.[1] While the construction of these reactors was suspended in September 1992, recent information suggests that Cuba may resume the construction if it obtains financial support. Our testimony is based on our report and on recent discussions with State Department, Nuclear Regulatory Commission (NRC), Department of Energy (DOE), Central Intelligence Agency, and International Atomic Energy Agency (IAEA) officials. We also had discussions with U.S. and foreign nuclear industry officials.

In summary, it is uncertain if and when Cuba's nuclear power reactors will be operational. It appears that no progress has been made on the construction of the reactors since the issuance of our 1992 report. The civil construction (such as floors and walls) of the first reactor is estimated to be about 90 to 97 percent complete, while the second reactor is only between 20 to 30 percent complete. However, if Cuba obtains the assistance necessary to complete the reactors' construction, a number of safety concerns must be resolved.

Specifically, it is possible that in the event of a severe accident, the containment structure--the ultimate barrier to the release of radioactive material in the event of an accident--could be breached, and a radioactive release could occur. It is possible that air currents could carry radioactive materials to the United States--possibly as far west as Texas and as far north as Washington, D.C. Furthermore, former Cuban nuclear and electrical engineers and a technician who worked at the reactor site and had emigrated from Cuba told us of safety concerns such as poor construction practices, that, if true, could affect the safety of the reactors' operation. In addition, there are unanswered questions about the potential for earthquakes at the reactor site because the Cuban government has not given the U.S. Geological Survey (USGS) the information that it needs to make the appropriate analysis.

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[1] Nuclear Safety: Concerns About the Nuclear Power Reactors in Cuba (GAO/RCED-92-262, Sept. 24, 1992).

Mr. Chairman, in cooperation with the State Department, we tried to gain permission from the Cuban government to visit the reactor site during the course of our 1992 review. In addition, we submitted a list of questions regarding the design, construction, and operation of the reactors to the Acting Principle Officer of the Cuban Interest Section, who said that he would submit them to Cuban nuclear power officials. However, we have never received a response from the Cuban government to our request for a visit or the answers to our questions. As you know, a few weeks ago, an NBC news crew visited the reactor site and shot extensive film footage, which included interior and exterior scenes of the containment building and the reactor vessel. Our review of this film assisted us in assessing the current conditions at the reactor site. I believe this film footage obtained by NBC represents the most current information on the Cuban reactors. On the basis of our review of this film footage, we have heightened concerns about the quality of the construction of the reactors. The film graphically portrays a nuclear plant in a state of deterioration that appears to be abandoned, rather than properly maintained.

According to the State Department, the position of the United States regarding the Cuban reactors has not changed since the issuance of our 1992 report. The United States prefers that the Cuban reactors not be completed and discourages other countries from providing assistance, except for safety purposes, to Cuba's nuclear program. In addition, Cuba must ratify the Treaty of

Tlatelolco, which it signed in March 1995. The treaty binds signatories to blanket nonproliferation commitments for their entire nuclear program and would allow IAEA inspections of Cuba's nuclear facilities.

THE DESIGN AND STATUS OF CONSTRUCTION OF THE CUBAN REACTORS

In 1976, the Soviet Union and Cuba concluded an agreement to construct two 440-megawatt nuclear power reactors near Cienfuegos on the south central coast of Cuba, about 180 miles south of Key West, Florida. The construction of these reactors, which began around 1983, was a high priority for Cuba because of its heavy dependence on imported oil. When completed, the first reactor would provide a significant percentage (estimated at over 15 percent) of Cuba's need for electricity.

Most of the reactor parts, except for civil construction materials, were supplied by the Soviet Union under bilateral economic cooperation agreements. Following the breakup of the Soviet Union, economic links to Cuba were disrupted as the Russian Republic shifted to a market-based economy and began providing technical assistance to Cuba on a commercial basis. These changes in the economic conditions contributed to the suspension of the reactors' construction.

Design of Cuban Reactors

Cuba's nuclear power reactors are the newest model of the Soviet-designed 440-megawatt pressurized water reactors (PWR) and are the first Soviet-designed reactors to be built in the Western Hemisphere and in a tropical environment. The Cuban model, called the VVER 440 V318, is the model that the former Soviet Union planned to export to other countries. The most notable difference between the Cuban model and other Soviet-designed reactors is that the Cuban reactors will have a full containment. The containment--a steel-lined concrete domelike structure--serves as the ultimate barrier to a release of radioactive material in the event of a severe accident. As discussed below, there are differences between the design of the Cuban reactors' containment and the containment of reactors designed in the United States.

NRC's 1989 Study of Cuban Reactors

Because of Cuba's proximity to the United States and the risk to which U.S. citizens may be exposed to a radioactive release in case of an accident, NRC performed a limited study to examine the containment design and safety features of the Cuban nuclear power reactors. The study, completed in 1989, discusses similarities and differences in safety characteristics between the Cuban reactors and comparable U.S. reactors.

NRC's study noted that although the design of the Cuban reactors has many features in common with those of the U.S. PWRs, several differences could lead to significantly different reactions in the event of a serious accident. For example, while the Cuban reactors, like the U.S. PWRs, use water to cool the reactor core, the Cuban reactors use a different system for handling the steam pressure that would be generated by a severe accident. In the Cuban reactors, the steam is condensed so that pressure is reduced in the containment structure. If, in the case of a severe accident, the system for condensing the steam in the Cuban reactors is bypassed and the steam reaches the upper portion of the containment in pressures greater than the upper portion's designed pressure retention capability of 7 pounds per square inch (other portions of the containment are designed to withstand pressures of about 32 pounds per square inch), the containment could be breached, and a radioactive release could occur. In contrast, U.S. PWRs are designed to accommodate pressures of about 50 pounds per square inch throughout the entire containment structure. The study indicated that the Cuban reactors and the comparable U.S. PWR are designed to accommodate similar types of accidents but concluded that it was difficult to compare the risk posed by the two types of reactors because the information required for such an assessment was not available for the Cuban reactors.

Status of Construction

On September 5, 1992, Fidel Castro announced that the construction of both of Cuba's reactors was suspended because Cuba could not meet the financial terms set by the Russian government to complete the reactors. Estimates of the amount of the civil construction completed for the first nuclear power reactor ranged from 90 to 97 percent, but only about 37 percent of the reactor's equipment (such as pipes, pumps, and motors) had been installed. For the second reactor, about 20 to 30 percent of the civil construction was estimated to be complete. No information was made available to us about the status of the equipment for the second reactor. According to responses to our recent inquiries, the status of construction has apparently not changed since the issuance of our 1992 report.

Mr. Chairman, in cooperation with the State Department, we tried to gain permission from the Cuban government to visit the reactor site during the course of our 1992 review. In addition, we submitted a list of questions regarding the design, construction, and operation of the reactors to the Acting Principle Officer of the Cuban Interest Section, who said that he would submit it to Cuban nuclear power officials. However, we have never received a response from the Cuban government to our request for a visit or the answers to our questions. As you know, a few weeks ago, an NBC news crew visited the reactor site and shot extensive film footage, which included interior and exterior scenes of the containment building and the reactor vessel. Our review of this film assisted us in assessing the current conditions at the reactor site. I believe this film footage obtained by NBC represents the most current information on the Cuban reactors. On the basis of our review of this film footage, we have heightened concerns about the quality of the construction of the reactors. The film graphically portrays a nuclear plant in a state of deterioration that appears to be abandoned, rather than properly maintained.

Concrete had been poured on the upper portion of the containment dome for the first unit. At the time of our review, the reactor's instrumentation and control system had not been purchased because Cuba did not have the hard currency to pay for them. Furthermore, the reactor fuel had not been delivered, and some key primary system components (1 reactor vessel, 6 steam generators, 5 primary coolant pumps, 12 isolation valves, 1 pressurizer and catch tank, and 4 accumulators) had been delivered but not installed. At the time of our 1992 review, these components had been stored outside on-site, and there was concern that the equipment was exposed to corrosive salt water vapor. The cost of the plant's construction was estimated, in 1992, at $960 million. It is estimated that it will cost about $300 million to complete the construction of the first reactor. We could not verify the validity of these estimates.

Recent news reports suggest that Cuba may resume the construction of the reactors with the financial assistance of Russia and an international consortium of major corporations. According to the State Department, several foreign companies have reportedly expressed interest in participating in the project and are currently carrying out a technical and feasibility study of the project reportedly to be released soon. To verify this information, we contacted representatives of the firms (Siemens AG [Germany], Ansaldo [Italy], EdF International [France], and NNC [England]) identified as potential participants in the international consortium. These representatives told us that their firms were not part of an international consortium to finance the completion of Cuba's reactors. However, representatives of two of the companies told us that they are performing, on behalf of the Russian company ATOMENERGOEXPORT, a financial and technical feasibility study designed to evaluate the costs to complete the Cuban reactors. According to one of these representatives, the study, described as preliminary in nature, is similar to studies currently being performed by western companies for eastern European nuclear reactors.

SAFETY CONCERNS RAISED BY FORMER CUBAN NUCLEAR POWER PLANT WORKERS

During our 1992 review, we talked with five Cuban individuals including nuclear and electrical engineers and a technician who had worked at the reactor site, all of whom had emigrated from Cuba and expressed concerns about the reactors. They believed that problems exist that could affect the safe operation of the reactors, such as the lack of a system to check the reactor's components, defective welds in the civil construction, and questionable training of future operators.

Allegations of Problems and Defects in Construction

According to the former Cuban nuclear plant workers, the nuclear facility did not have a good system to check the reactor's components. For example, two individuals alleged that advisers from the Soviet Union working at the reactor site could not guarantee that the valves installed in the first reactor's emergency core-cooling system would function under certain conditions. Although the Soviet advisers told the Cuban officials that the valves had been tested, the advisers did not provide any documentation showing the test results. Emergency core-cooling systems are an important part of the reactor because they help ensure that in the event of an accident in which coolant is lost, radioactive material does not escape into the environment.

The former Cuban technician, who was responsible for checking welds in the civil construction, told us that he and a Soviet technician had examined X-rays from about 5,000 weld sites that had passed inspection. They found that about 10 to 15 percent of these welds were defective. Although the Cuban technician did not know exactly where the pipes with the defective welds were located, he thought that they were part of the auxiliary plumbing system. According to this former technician, a group of Soviet officials also reviewed the X-rays and confirmed that the welds were defective. Another individual said that even though defective welds were found in the containment dome, concrete was still poured.

Former Cuban nuclear plant workers alleged that defective welds were also found in hermetic seals, in support structures for the primary components, and in the spent fuel cooling system. The seals and support structures are important to safety because they are part of the containment that prevents radioactive material from leaking into the environment if an accident occurs. The spent fuel cooling system is important because it prevents radioactive material from leaking if overheating occurs.

Allegations of Inadequate Simulator Training

According to one former Cuban nuclear plant worker, individuals trained to be reactor operators received 5 months of instruction from the Russians on a VVER 440-megawatt model V230 reactor simulator at the Novovoronezh nuclear power plant in Russia. However, he said that the value of this training is questionable because this simulator does not resemble the reactor under construction in Cuba. In addition, he said that some Cuban reactor operator trainees had asked for training on a VVER 1,000-

megawatt reactor simulator because it was similar to the reactor in Cuba, but were not trained on it. Furthermore, according to an NRC official, Soviet-designed simulators are slow-response simulators and are considered deficient by U.S. standards because they do not simulate an accident as it would actually happen.

NRC OFFICIALS' CONCERNS ABOUT ALLEGATIONS OF SAFETY DEFICIENCIES

NRC officials familiar with the allegations raised by the former Cuban nuclear power plant workers concluded that these individuals were knowledgeable in their respective areas and that the deficiencies they alleged could affect the construction and future safe operation of Cuba's nuclear reactors. However, because the information available on the reactors was limited, NRC officials had no way of verifying the validity of these concerns. An NRC official told us that NRC was concerned about (1) the adequacy of Cuba's nuclear regulatory infrastructure, (2) the adequacy and number of trained regulatory and operational personnel, and (3) reports of defective welds.

NRC's Director of Bilateral Cooperation and Assistance recently told us that NRC has not had any recent contact with the Cubans and wondered whether that plant has been adequately maintained. He said that NRC has the same concerns about the Cuban reactors that it had at the time our report was issued. He also said that he doubted whether there is a viable nuclear regulatory body in Cuba that could license the plant in accordance with internationally recognized nuclear safety standards.

ASSESSMENTS OF RISKS FROM EARTHQUAKES AND DISPERSION OF RADIOACTIVE POLLUTANTS

According to USGS' Chief, Latin American Programs, USGS has not assessed the risk of an earthquake in Cuba, in part, because the agency does not have access to the information required for this type of analysis. USGS attempted to obtain this information, but the Cuban government has not provided it. Therefore, USGS cannot answer specific questions about the seismic conditions at the site of the reactors in Cuba.

However, according to a USGS official, the Caribbean plate, a geologic formation near the south coast of Cuba, is active and may pose seismic risks to Cuba and the reactor site. The plate could produce large to moderate earthquakes. In fact, on May 25, 1992, this plate produced an earthquake measuring about 7.0 on the Richter scale. A 1988 assessment by an international insurance group estimated that the Cienfuegos area could produce an earthquake with a probable maximum magnitude of 5.0 on the Richter scale.

At our request, scientists from the National Oceanic and Atmospheric Administration analyzed the probability of impact, the average arrival time, and the relative concentrations of radioactive pollutants that would be released into the atmosphere by an accidental release of radioactivity from the nuclear power reactors in Cienfuegos, Cuba.[2] On the basis of climatological data for the summer of 1991 and the winter of 1991-92, the analysis showed that the summer east-to-west trade winds could carry radioactive pollutants over all of Florida and portions of the Gulf states as far west as Texas in about 4 days. In the winter, when the trade winds are weaker and less persistent, radioactive pollutants would encounter strong westerly winds that could move the pollutants toward the east, possibly as far north as Virginia and Washington, D.C., in about 4 days.

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[2] Jerome L. Heffter and Barbara J. B. Stunder, Transport and Dispersion for a Potential Accidental Release of Radioactive Pollutants From the Nuclear Reactor at Cienfuegos, Cuba, NOAA, Air Resources Laboratory (Aug. 1992).

CURRENT U.S. POLICY

According to a State Department official, the position of the United States regarding the Cuban reactors has not changed since the issuance of our 1992 report. The United States prefers that the Cuban nuclear reactors not be completed and discourages other countries from providing assistance, except for safety purposes, to Cuba's nuclear program. The U.S. position is that sales and or assistance to the Cuban nuclear power program should not be provided until Cuba has undertaken a legally binding nonproliferation commitment, including a commitment to accept full-scope IAEA safeguards on all present and future nuclear facilities. In addition, Cuba must ratify the Treaty of Tlatelolco, which binds signatories to blanket nonproliferation commitments for their entire nuclear program and would allow IAEA inspections of Cuba's nuclear facilities. Cuba signed that treaty in March 1995.

CONCLUSIONS

In summary, a number of concerns exist about the Cuban reactors, including concerns about the quality of the civil construction completed to date, the lack of a regulatory organization, and the adequacy of operator training. If the allegations of safety problems are true, the safe operation of the reactors could be affected. In addition, it is unclear how well the equipment on-site has been maintained and preserved. Although the reactor will have a containment building and an emergency core-cooling system, which lessens the likelihood of an escape of radiation in the event of an accident, the containment dome was not designed to withstand pressures as great as U.S. containment structures can withstand.

We believe that continued monitoring of Cuba's progress toward completing the reactors is warranted. If Cuba obtains the assistance needed to complete its nuclear power reactors, U.S.

officials will need assurances that all safety concerns are resolved and that the reactors are built and operated in a manner that does not pose a risk to the United States.

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This concludes our prepared statement, Mr. Chairman. We would be pleased to respond to any questions that you or other Members of the Subcommittee may have.

(170263)

PELAYO CALANTE GARCIA

SUMMARY OF QUALIFICATIONS

My experience has been as a quality inspector during the construction and assembly of the Nuclear Power Plant in Cuba and as professor/researcher at the Advanced Institute for Nuclear Sciences and Technology. I also received operator training in Power Plant. Strong design background. Extensive experience in developing experimental systems and lab. practices in mechanical field. Experience in predictive maintenance using diagnostic by vibrations.

I am creative, reliable, hard worker, eager to solve problems. Team player and able to work without supervision. I have an extraordinary sense of humour.

EMPLOYMENT

The Association for Clean Energy, Ottawa, 6/95 to present.

VOLUNTEER WORKER - *Working in a comparative analysis of alternatives to nuclear waste disposal systems*

Ottawa City Hall, Boiler Room 2/95-4/95.

VOLUNTEER WORKER - *Worked as stationary engineer.*

Memorial University of Newfoundland, St. Jonh's 2/93-5/93

VOLUNTEER WORKER- *Introduced an experimental equipment to determine the thermal conductivity of different insulation materials. Developed computer program in "Turbo C" in order to determine the overall heat-transfer coefficient in heat exchangers.*

University of Thermophysics, Novosibirsk, Russia 11/91-1/92

Ph.D. TRAINER- *Created an experimental equipment for research in Heat Transfer in Two-Phase Flow. This equipment is used by scientists and students in the Heat Transfer Laboratory at the University of Thermophysics.*

Advanced Institute for Nuclear Sciences and Technology,
Nuclear Energy Department, Cuba 5/84-11/91

ASSISTANT PROFESSOR/RESEARCHER- *Taught courses in Nuclear Power Plants, Construction and Assembly of Nuclear Power Plants. Developed 18 laboratory practices and experimental systems in Heat Transfer, Hydraulic, Nuclear Safety and Steam Generators which had very successful results for the Nuclear Energy Department saving $62,000.*

Nuclear Affairs Executive Secretariat, Cuba 7/87 to 10/91

TECHNICAL ASSISTANT AND QUALITY INSPECTOR - *I worked at the Juragua Nuclear Power Plant. My responsibilities included:*
Inspecting the technological systems that arrived from Russia;
Testing the pumps using piezoelectric accelerometers.
I head the team that inspected the valve factory ***"Walthon Weir Pacific S.A."*** *in Spain, in order to approve the quality of the safety valves which were being sold to the Power Plant for $10 million.*

EDUCATION

1981-84	**M.S. - Thermophysical Engineering** Moscow Institute of Power Engineering, Russia.
1978-81	**B.S. - Thermophysical Engineering** Moscow Institute of Power Engineering, Russia.

I have applied for the licence of Association of Professional Engineers of Ontario. I have obtained the Canadian Equivalent degree from the University of Toronto.

TRAINING AND ADDITIONAL COURSES

"Lotus 123" St. Patrick's School, Ottawa, (1994) 150 hours.
"WordPerfect" St. Patrick's School, Ottawa (1994) 150 hours.
"English Language" St. Patrick's School, Ottawa (93/94) 950 h.
"Stationary Engineer Training"
Tallapiedra Power Plant, Havana, Cuba (1989) 800 hours.
"Diagnostics by Vibrations"
Superior Polytechnic Institute, Havana, Cuba (1989) 40 h.
"Construction and Assembly of Nuclear Power Plants"
Kozloduy Nuclear Power Plant, Bulgaria (1987) 200 hours.
"Quality Control"
Juragua Nuclear Power Plant, Cuba (1986) 90 hours.
"Quality Guarantee"
Juragua Nuclear Power Plant, Cuba (1986) 70 hours.

PUBLICATIONS:

"CAIR: All purpose experimental system for educational application". 1991, Journal of Cuban Education Ministry

"Teaching the course The Construction and Assembly of Nuclear Plant combining theory of bonding with practical work". Boletin Tecnico of Juragua NPP, 1992. This was based on a presentation made at the Technical Symposium in the Juragua Nuclear Power Plant

LANGUAGES: *English, Spanish, Russian.*

HOBBIES: *Reading, Sports, Photography, History, Computer.*

PERSONAL DATA: *Married, 2 children, excellent health.*

REFERENCES: *Available upon request.*

STATEMENT OF PELAYO CALANTE GARCIA, FORMER PROFESSOR, ADVANCED INSTITUTE FOR NUCLEAR SCIENCE AND TECHNOLOGY BEFORE THE SUBCOMMITTEE ON THE WESTERN HEMISPHERE

August 1, 1995

Mr. Chairman, I appreciate the opportunity to present my concerns about the construction of the Juragua nuclear power plant in Cuba. I was involved in the initial construction of the Juragua nuclear power plant from June 1984 to October 1991 when I left Cuba. I was responsible for quality inspections in the containment building. I will provide my resume for the record.

Problems Concerning Construction and Assembly of Juragua Nuclear Power Plant

1. The reactor containment structure, which is designed to prevent the accidental release of radioactive material into the atmosphere, contains defective welds in seals in the containment building and in support structures for the primary components such as the steam generators.

2. The system to reduce pressure in the containment building has not been tested. If this system fails, the containment building could be breached, and a radioactive release could occur.

3. There is no quality assurance system. For example, the welders are not certified and have a poor work ethic which has resulted in many mistakes in welding equipment, piping, pumps, valves, and seals in the construction of the containment building.

4. Even though the plant has been seismically designed, the primary coolant system isolation valves and other valves in the primary circuit have not been certified to function under seismic conditions.

5. Training for reactor operators has been inadequate. For example, the Juragua nuclear power plant is a VVER-440, model V213 and the reactor operators were trained on a VVER-440, model 230 which is an older Soviet-designed reactor that has fewer safety systems.

6. Since 1987, the exposure of salt air has corroded safety equipment that has already been assembled such as pumps, valves, pipes, heat exchanger, and water tanks. Moreover, the nuclear reactor vessel should be protected in a nitrogen atmosphere in order to avoid rusting. However, the reactor vessel has been exposed to the salt air in open form, without any protection, since late 1990. Rust on the reactor vessel can affect the integrity of welds and can cause weakening of the reactor vessel.

Mr. Chairman, that concludes my testimony and I welcome any questions from the Committee.

WRITTEN TESTIMONY
OF
ROGER W. ROBINSON, JR.
BEFORE THE
HOUSE INTERNATIONAL RELATIONS COMMITTEE
SUBCOMMITTEE ON THE WESTERN HEMISPHERE

CUBA AND THE JURAGUA NUCLEAR POWER COMPLEX

1 AUGUST 1995
2172 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, D.C.

Mr. Chairman, it is a privilege to appear before the subcommittee on a pivotal issue in our relationship with Castro's Cuba and the ultimate transition to a Democratic Cuba -- the Soviet-designed Juragua nuclear complex near Cienfuegos (sometimes referred to as the Cienfuegos project). Over the past decade, I have served as President and CEO of RWR Inc., a Washington-based consulting firm, and was formerly Senior Director for International Economic Affairs at the National Security Council under President Reagan. Prior to my government service, I was a Vice-President in the International Department of the Chase Manhattan Bank with responsibilities for Chase's loan portfolio in the USSR, Eastern Europe and Yugoslavia.

Since the American people learned of the advanced stage of construction of the first of two VVER-440 reactors in the Spring of 1991 -- which was some 60-70% complete at the time -- I have tried to monitor this portentous project and the associated implications for our national security. In my capacity as a member of the Board of Advisors of the Center for Security Policy, I co-authored several Decision Briefs published by the Center from May 1991 until the time that the Cienfuegos project was reportedly mothballed in April 1992[1]. The bottom line concerning recent reports of the project's revival under the sponsorship and coordination of Moscow is simply this: The Juragua complex is even more frighteningly flawed and unacceptable today -- given the passage of time and corrosive exposure to the elements -- than it was some three years ago.

In the course of this testimony, I would like to review briefly why -- when viewed from a wide-angle policy lens -- the Cienfuegos project is important and emblematic of other past and present global flash-points catalyzed by energy-related foreign policy dramas. Some of the troubled legacy of the reactors' construction and steps reportedly underway to revitalize the project will likewise be addressed. Finally, I will offer several policy recommendations directed toward ensuring that the *current* Juragua complex never comes on-line.

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[1] See, for example, Cienfuegos - "A Hundred Fires": *Muchas Gracias* Moscow, But No American Chernobyls, No. 91-P 44, 31 May 1991; A "Ticking" Anniversary Present: Will Russia Give Us A Chernobyl Ninety Miles Off The U.S. Shore?, No. 92-D 41, 23 April 1992; "Hear Us Now And Believe Us Later": Business Done With Fidel Means Big Losses When Communists Fall, No. 92-D 51, 8 May 1992; Castro's Potemkin Nuclear Shutdown: Chernobyl At Cienfuegos Still In Prospect, No. 92-D 108, 10 September 1992.

Why Cienfuegos Matters

Today the United States is simultaneously facing several fateful foreign policy crossroads -- the Balkans crisis, China policy, the Middle East peace process, managing Iraq, Iranian nuclear and oil-related developments, the Korean peninsula and others. The White House has thus far generally erred on the side of "engagement" as opposed to containment, isolation (e.g., like that of Iran) or even, in the case of Bosnia, limited military action. China broke the code for Cuba and other centrally-controlled economies on permitting economic liberalization while maintaining repressive political control. (Many are now wondering if Beijing has over-played its hand even with this White House in expanding missile proliferation, contemptuous human rights violations, saber-rattling over Taiwan and unfair trade practices.) Vietnam certainly took a page from the Chinese play book in its relations with the U.S. and is now awaiting lavish trade-related and financial rewards for its gradual economic opening and still-pervasive authoritarianism. This same cadre of Clinton policy-makers appears today to be working hard to devise a Vietnam-style "road map" for incremental normalization of relations with Havana.

Although this assertion is vigorously denied by the Administration, the policy tactics and wedge-building being employed by the State Department and White House are quite familiar. Indeed, the confusing signals emanating from this Administration concerning its overall Cuba policy are also manifest in its official position on the Juragua nuclear facility. A recent State Department release on the project states "In the event construction [on the Juragua reactors] were to proceed, however, we would continue to vigorously pursue initiatives that would improve the safety of the facility and promote its safe operation." This policy position says, in effect, "we strongly object to Havana proceeding with this nuclear complex [which fundamentally undermines our security interests] but if the Castro government chooses to ignore our diplomatic protests, please complete the project with as many safeguards as possible." Regrettably, we will probably soon be hearing this same basic Administration policy prescription with respect to Russia's supply of nuclear reactors to Iran.

As shrewd observers of the international scene -- assisted by the massive Russian signals-intelligence facility at Lourdes, Cuba -- Fidel and his associates have had little difficulty in judging the time propitious to either complete their existing fatally-flawed VVER-440 reactors or shake down the U.S. and international community for some kind of substantial compensatory alternative. After all, what other conclusion can Havana reasonably reach from the cynical, short-sighted Western policies on display in the North Korean reactor-payoff scheme and the Russian-Iranian nuclear gambit? In short, it is clear to the Castro government that, with Moscow's help, the United States can be had.

To disabuse Havana of its assumption that revival of the Juragua complex will somehow have a large direct or indirect payoff in the end, it may be worthwhile recalling another world-class energy deal pursued by the Soviet Union under Ronald Reagan's watch. Like Moscow's two-strand Siberian gas pipeline deal in the early 1980's, the Cienfuegos complex is an unprecedented "national project" with potentially decisive implications for the country's long-term energy viability, hard currency earnings structure, attraction of other foreign direct investment, access to international financial institutions and, of course, nationalistic pride. More subtle are the national security parallels of these pivotal energy deals.

In the case of the Siberian gas pipeline project, Moscow was well aware of the inordinate West European dependancy on Soviet natural gas supplies -- ultimately projected to exceed 60% of total European gas consumption -- which would have resulted from the successful completion of both strands of the twin 3,600-mile pipelines connected to the West European gas grid. More secure Western suppliers of natural gas would always be underbid by the Soviet gas monopoly Gazprom -- then headed by today's Russian Prime Minister Victor Chernomyrdin -- because of the absence of a Western cost structure (e.g., administered prices). The subsequent use of "energy warfare" by the former Soviet Union against the Baltic states, Ukraine, Azerbaijan and others who have dared to challenge Moscow's will are now a matter of historic record. (This kind of heavy-handed use of energy-related leverage is still regarded as a useful policy tool by Russia, particularly given Chernomyrdin's ascendancy to leadership.)

In a somewhat different way, Cuba's completion of the Juragua reactors could likewise empower the Castro government with a menacing -- and even devastating -- new policy lever in its relations with the United States. A Cuban nuclear accident -- either of a technical nature or the result of sabotage -- could have a similar effect to the detonation of a nuclear weapon near the United States, laying down a curtain of radioactive fallout that, depending on the season and prevailing winds, could either stretch across the lower tier of this country to Texas or race up the Eastern Seaboard to Washington D.C. and possibly beyond within the first four days.

A determined stand by President Reagan with Moscow and our allies terminated the planned second strand of the Siberian gas pipeline deal, delayed completion of the first strand by two years at enormous cost to Moscow and secured an alliance agreement to establish a strict ceiling on Soviet gas deliveries to Western Europe (i.e., 30% of total gas supplies) in favor of the accelerated development of secure Western supply alternatives. In addition, the Reagan Administration simultaneously -- and successfully -- acted to strengthen multilateral export controls on militarily-relevant technology and end subsidized official credits to Moscow. An equally determined U.S. stand now on the Juragua complex would involve President Clinton and those seeking the Republican nomination making clear to Havana and Moscow that this current, unfixable project will not be allowed to come on-line under any circumstances.

There are other characteristics of the Cienfuegos project reminiscent of the now-historic U.S.-Soviet "pipeline dispute:"[2]

- European governments, companies and banks simply did not share the U.S. view that Moscow should be penalized for its sponsorship of repressive martial law in Poland (and near Soviet invasion) in the early 1980's, but instead should be *de facto* rewarded with the largest single Western taxpayer-subsidized transaction in the history of East-West trade.
- The preponderance of voices in Europe, the media, the global business community and even the bulk of the Reagan Cabinet called for abandoning the use of economic sanctions to limit Soviet policy options and damage its rigid, centrally-controlled economy (a possibility dismissed out of hand), arguing that "engagement" or commercial bridge-building would be the key to improved Soviet geopolitical behavior.
- A thunderous rejection by most of the foreign policy establishment of the notion that an American President's resolve to take a stand on the twin Siberian gas pipelines, high-technology export controls and official financial subsidies could ever hope to slow -- much less ultimately derail -- the Soviet juggernaut as a permanent superpower fact on the political landscape.

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[2] This alliance policy dispute has, for several years, been a case study at Harvard's Kennedy School of Government.

One does not have to search hard to extract from the line taken by Moscow and the allies in the pipeline case the bulk of the arguments being used today in the effort to finesse -- and, in the end, live with -- the completion of the Juragua complex no matter how defective it is reliably reported to be. As with the Siberian pipeline deal, if European firms, governments and financial institutions do not remain in the supply and funding game, Juragua has almost no chance of being realized. It is important to recall that Castro already has committed some $1.2 billion to constructing this facility and faces a similar sum required to complete the two reactors -- a price-tag equivalent to almost two years of his country's total hard currency export income. Accordingly, there will probably be no near-term end to Havana's discussions with Russia, Germany, France, Italy, Brazil and others concerning how and when to revive the Cienfuegos deal, even if it should again be consigned to mothballs due to robust U.S. Congressional opposition. The only way around this Saddam Hussein-like phenomenon is to put a proverbial stake in the heart of this coming nuclear nightmare *now*.

Finally, this Moscow-sponsored Cuban nuclear deal is of a piece with energy-related foreign policy dramas currently playing an increasingly dominant role in world politics. For example, if one examines key underpinnings of the Russian invasion of Chechnya (e.g., securing strategic pipelines), Kremlin efforts to isolate Azerbaijan and Turkey, Moscow's intention to ignore provisions of the Conventional Forces in Europe (CFE) agreement in the Caucasus, the escalating threat posed by Iran and North Korea, China's increasingly belligerent forays in the Spratley Islands and Germany's plans to develop a nuclear research reactor using highly-enriched, weapons-grade uranium, a common theme emerges -- energy. Moreover, most of these potential front-burner challenges to vital U.S. security interests involve ostensibly civilian nuclear reactor projects. Consequently, to preserve the credibility of U.S. anti-proliferation efforts and the message to our allies and potential adversaries that we mean business on ensuring the safe, benign global development of nuclear energy, it is essential that we view the Cienfuegos nuclear project as a litmus test of American political will for the 21st century. If we cannot muster the national determination to take a stand on a nuclear danger in our immediate proximity, how does this country even hope to protect itself from some two dozen nations which have acquired -- or are projected to acquire by the end of this decade -- weapons of mass destruction, some with ballistic missile delivery systems?

What's Wrong With This Picture?

Mr. Chairman, I have discussed several subjects relating to the strategic threat posed to U.S. national security interests by the Juragua complex, as well as what are -- in my view -- similar policy scenarios playing out elsewhere in the world. I would now like to touch briefly on the crux of this issue; namely, what exactly makes these reactors so unsafe. After all -- the argument goes -- we have successfully harnessed atomic power to generate electricity for civilian purposes for almost half a century with, but for one major exception, no major disasters. What could be so dangerous about *these* reactors?

The simple fact is, of course, that *virtually everything* is dangerous about these reactors. Several technical experts -- some of whom are with us today -- have discussed the numerous and debilitating technical faults of the plant, faults that are so fundamental to the construction and operation of the reactors that no "fixes" such as a modern control room or IAEA "safeguards" will be able to remove the danger. It is these critical safety issues that have brought us together today, so I feel obliged to restate some key areas of concern likely to plague us if Juragua is ever brought on-line.

- Sixty percent of the Soviet-supplied materials used in these reactors are defective, according to knowledgeable Cuban defectors from the project.
- Integral reactor systems -- including the reactor vessel itself, six steam generators, five primary coolant pumps, twelve isolation valves and more -- were stored outside for up to eighteen months, exposed to the highly corrosive tropical sea air and weather. Also, no nuclear reactor of Soviet design has ever been constructed in a tropical climate.
- The support structures of key reactor components contain numerous structural defects.
- The containment dome of the first reactor is designed to withstand pressures of only seven pounds-per-square-inch (psi), compared to the fifty psi in American reactors, leaving the Juragua dome exponentially weaker than an American reactor *even in the event that the dome functions perfectly as designed* -- an unlikely prospect in the current situation.
- As many as fifteen percent of 5,000 previously-approved welds in the reactor's auxiliary plumbing, containment dome and spent-fuel cooling systems were x-rayed and found to be defective due to air pockets, poor soldiering and heat damage.

The mere suspicion that even one weld is faulty will earn an American nuclear plant a suspension from the Nuclear Regulatory Committee.

- Cuban operators of the facility have received the precious little knowledge they have of their future craft from some training on Soviet "slow-response" simulators -- deemed inadequate by U.S. standards as they do not simulate an actual crisis event in progress or even resemble the reactors at Juragua.
- The design of the VVER-440 pressurized water reactor (PWR) is fundamentally dangerous, even with the addition of the containment domes. As already mentioned, VVER-440 model reactors built by the Soviet Union in then-East Germany were closed as soon as possible by Bonn following reunification. Despite these inadequacies, Siemens is reported to be considering the possibility of utilizing components from the closed GDR plants in the construction at Juragua.

Also, there are indications that:

- Soviet advisors refused to guarantee to their Cuban hosts that the valves installed in the first reactor's emergency cooling system would function under certain conditions.
- Many component parts originally designed for specific applications have been used to substitute for proper -- but unavailable -- components, increasing the likelihood of a disastrous accident by an unknowable factor.
- Cuban intelligence knowingly destroyed x-ray photos and other evidence proving the extent of the reactor's flaws, making it virtually impossible to take effective corrective action to repair the welds.
- The Cienfuegos area is seismically active, making it a poor place to put even the safest reactor.

These flaws are illustrative of the myriad technical problems facing the Juragua reactors. Coupled with Cuba's inadequate human and technological infrastructure -- poor even by the Soviet standards that gave the world Chernobyl -- a rational conclusion can be drawn: *Any nuclear facility constructed in Cuba at any time in the future should be constructed entirely from the ground up, and must not incorporate any construction or components present in today's Juragua project.*

A Syndicated Russian-European Restart?

Despite this project's terminal shortcomings, strong interest remains in bringing the nuclear complex to completion. It is therefore useful to examine briefly the parties driving this deal and their likely motivations. As mentioned earlier, this estimated $2 - $2.4 billion project is well beyond the indigenous capability of a destitute Cuba and would require large-scale financing from European suppliers and Russia. As the architect of the decision to revitalize Juragua, Russia's Ministry of Atomic Energy (MinAtom) -- with full government support -- is reportedly seeking to syndicate the required financing to complete the project through a consortium of European suppliers said to include the German giant Siemens, Electrictie de France and Ansaldo SpA of Italy.[3] Given Cuba's atrocious sovereign credit rating, deemed worst in the world in 1994 by Euromoney[4], there is little doubt that these firms will be provided by their respective governments with 100% taxpayer-guaranteed credits and/or insurance coverage to virtually eliminate the otherwise untenable commercial and political risk associated with substantial exports to Havana.

Indeed, it can be reasonably expected that official European export support programs like Hermes of Germany and COFACE of France will be pleased to accommodate -- under political guidance -- any requests from such major firms to help establish national export beachheads in Cuba. Accordingly, as this reported "joint stock company" -- in Moscow's parlance -- evolves, careful congressional scrutiny of any Western government risk insurance or official credits/credit guarantees is warranted. The presence of such taxpayer-underwritten arrangements would make participating European governments partners in the Cienfuegos restart -- with all the attendant culpability and foreknowledge.

Russia's nominal leadership of such a syndicated revival effort would probably be secured by a modest contribution of perhaps $25 - $100 million -- commensurate with its defaulted creditor status (read: repeated debt reschedulings). In the 1992-1994 period, Russia began to prime the pump for Cienfuegos with a $30 million credit line to Cuba, ostensibly to improve the mothballing of the project.

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[3] "Russians Say They Are Coming to Build Cuban Nuclear Plant", *The Wall Street Journal*, 6 June 1995.

[4] Euromoney, "1994 Country Risk Report"

Not only would Moscow like to see prospects improve for much-needed Cuban debt repayments (no matter how modest) by bringing Juragua on-line, other political and economic benefits would likely include:

- Plaudits from the vast majority of UN members, who would likely view Moscow's Juragua initiative -- and Russia's probable success in recruiting "name" European firms -- as a heroic effort to break the "unfair" economic embargo against Cuba.

- An opportunity to advance Russia's global reputation as a reliable supplier of nuclear reactors in the midst of a cut-throat competition with China and other players in this lucrative marketplace.

- The generation of vast new Cuban goodwill (and future sweetheart deals) that Moscow could translate into multi-year renewal of its 1000-man signals intelligence listening facility at Lourdes enabling it to continue to eavesdrop on America's sensitive commercial and government communications.

- A potential future bargaining chip with the U.S. -- probably in the context of the Gore-Chernomyrdin Commission -- to secure multi-billion dollar (U.S. taxpayer-financed) concessions if the Administration insists on the project's termination or total reconstruction.

- Possible "expressions of appreciation" from select European firms that -- thanks to Moscow -- would have yet another opportunity to cover their business risk exposure in the warm blanket of taxpayer-underwritten credit guarantees and insurance arrangements.

- Long term preferential treatment for Russian suppliers in a potential expanding Cuban market due, in no small part, to the electric power, jobs, infrastructure development and West European life-support provided by an operating Juragua reactor complex.

In addition, Cuba probably stands to benefit substantially from even a serious international discussion regarding the completion of Juragua. Cuba today faces desperate energy and electricity shortfalls, often leaving civilians -- and businesses -- without power for hours on end. Two of the most promising areas of interest to potential foreign investors are the tourism and mining industries, both of which are electricity-intensive. The ability to assure a long-term, consistent supply of electricity will be required to attract foreign investment into these -- and other -- sectors of the economy. Cuba's abysmal credit rating -- a serious constraint to borrowing on international capital markets -- is not a problem if and when European firms are able to line up government-backed supplier credits and guarantees to help develop Havana's energy sector. This crucial outside assist would, in turn, free up indigenous resources to perpetuate the Castro regime, albeit at an anemic level. even if the project is ultimately abandoned, Cuba's burgeoning international business profile -- and likely Western compensation package for halting construction -- would be well publicized, probably contributing to a weakening of the U.S. embargo.

It is also interesting to note as we discuss who benefits from this project the deafening silence of what would logically be one of the project's harshest critics, the world environmental community. The environmental catastrophe resulting from a nuclear accident at the Juragua complex could well surpass any in the history of this hemisphere. With NBC Nightly News again broadcasting a special investigation of the Cienfuegos project on 20 July -- at least the third such network news expose -- it is a mystery why Greenpeace, Worldwatch and other environmental activists have not already mobilized to oppose the revival of the Juragua reactors. In relative importance, the dangers to the ecosystem likely to emanate from Cienfuegos dwarf those associated with the celebrated proposed sinking of Shell's Brent Spar off-shore oil storage facility. If this averting of eyes continues, it would be fair to speculate that some twisted sense of political correctness may be at work here. For example, could it be that a fascination with Castro's mystique and revolutionary impulses would be allowed to blur or undermine the environmental community's stated global mission? It therefore remains to be seen if impending eco-disasters have any politically-differentiating characteristics (e.g., big oil and Western governments versus socialist nuclear developments).

Conclusion & Policy Recommendations

In conclusion, our nation is now forced to decide if the Cienfuegos project is to serve as a case study of how to shorten the life of tyrannical regimes which deny basic human liberties. In short, is our policy toward Cuba to be one of "engagement" and expanding Western life-support or isolation and bail-out avoidance? For those who suggest that the prospects for the success of the latter strategy are bleak, I have pointed to similar passionate arguments leveled at the first-term Reagan national security community (i.e., NSC, CIA and the Defense Department), which dared to formulate a strategy to stress out Soviet economic rigidities.[5] The results of this earlier effort are clear: The brittle, centrally-controlled Soviet system could not withstand significant contraction in Western life-support in the areas of officially subsidized financing, access to high technology and energy-related assistance and markets. I would also argue that Fidel has considerably fewer options to cope with the denial of Western subsidies than the resource-abundant Soviet Union, which lumbered on for another eight years.

Castro is likely calculating -- as a minimal fall-back position -- that the presence of this profound new danger off our shores will ultimately result in U.S. "engagement" advocates rushing forward with a proposal to "make the reactors safe" and take advantage of this important new "window of bilateral cooperation." Thus far, he has probably been encouraged that yet another Clinton Administration reactor buy-off gambit is in prospect. It will probably be up to the Congress to prove him dead wrong. Falling into a calculated policy trap of this dimension would be comparable to the utter fecklessness and miscalculation on tragic display today in Bosnia. Simply put, what the beleaguered Cuban people need now is to have the Castro government put out of business, not given a new, taxpayer-financed lease on life.

On the matter of "hot-button" issues for the international business community like contract sanctity, extraterritoriality, unilateralism and import controls, some new global realities have to be faced squarely. With some twenty or more countries actively seeking to acquire weapons of mass destruction and ballistic missile delivery systems -- primarily through Iraqgate-style covert procurement networks -- it is an unaffordable luxury to respect these strongly-supported features of the international trading system in circumstances of overriding peril to our nation's fundamental security interests. Like Conoco's ill-fated Iranian venture, this project represents such a circumstance.

Accordingly, those Western and Latin American companies and banks working to advance the completion of the Cienfuegos nuclear complex should be subject to swift and decisive penalties by the Congress. Import controls should probably be the sanction of choice for private sector Western entities supplying Juragua, requiring an executive decision by the management of these firms between doing business in the American market or the Cuban market. (U.S. import controls were imposed for several months on five European firms -- three of which subsequently failed -- which supplied the Siberian gas pipeline project over the Reagan Administration's objections with the desired result of leveraging a new, security-minded allied East-West trade policy.) Governments choosing to back-stop such companies and financial institutions should have more than one bilateral priority put at risk by the Congress, if the Executive Branch fails to demonstrate adequate resolve.

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[5] An outline of this Reagan economic strategy toward the former Soviet Union is provided in a recently published book by Peter Schweizer entitled Victory: The Reagan Administration's Secret Strategy That Hastened the Collapse of the Soviet Union, Grove/Atlantic, 1994.

Finally, the Russian government needs to understand forthwith that continuing to support this MinAtom initiative to revive the Juragua reactors -- much like its efforts to complete Iran's light-water reactors -- will have severe consequences. For example, MinAtom's eligibility to serve as a partner with the U. S. Enrichment Corp. in the $12 billion U.S. - Russia uranium deal would need to be reexamined. If necessary, Congress should utilize upcoming legislative opportunities to suspend -- and even terminate -- this deal with MinAtom contingent on that Russian agency's handling of this Cuban reactor deal. The American people should not be asked to bridge-finance Russia's atomic energy ministry when it is simultaneously engaged in supplying, and eventually fueling, a burgeoning nuclear threat to the United States.

Other bilateral initiatives in the energy area -- such as U.S. Eximbank and OPIC financing, guarantees and insurance coverage to support expanded Russian oil and gas production -- should likewise be put at risk by the Congress, pending Moscow's immediate disengagement from this prospective Cuban Chernobyl. Any attempts by Russia or other governments to fuel completed reactors in Cuba should be interdicted by the United States, by any measures deemed necessary.

In closing, Congress should demand that Russia's announced intention to complete the Juragua nuclear complex be placed at or near the top of the agenda of the next session of the Gore-Chernomyrdin Commission. Indeed, the absence of this agenda item ought to be viewed with profound concern. Finally, all of the presidential candidates should, in the course of their respective 1996 campaigns, pledge to the American people that they will not permit -- through announced disincentives for Moscow and allied firms or, failing that, direct interdiction -- the irretrievably-flawed nuclear reactor complex at Cienfuegos to be completed, fueled and brought on line, at least not on their watch.

Congress of the United States
House of Representatives
Washington, DC 20515

June 8, 1995

The President
The White House
Washington, D C 20515

Dear Mr President

We urge you to use all the instruments at your disposal to pressure the Russian government to immediately halt their intentions of aiding the communist regime of Fidel Castro to finish construction of the Juragua nuclear power plant in Cienfuegos, Cuba If completed, this nuclear plant will pose a serious threat to the safety of the United States, Central America and the Caribbean.

Construction of the Juragua nuclear plant was halted in 1992 after the Castro regime was not able to obtain the foreign exchange necessary to finish its construction. However, this past May, Russia and Cuba announced their intention to finish construction of the plant obtaining the financing for its completion from a joint stock company composed of British, Brazilian, German, Italian and Russian companies

Completion of this nuclear plant would constitute the introduction of a real and permanent threat to the health and safety of our hemisphere Numerous experts, including former technicians at the plant who are now in the U.S, have denounced its inadequate construction and inferior equipment used in its construction. Moreover, the General Accounting Office reported allegations in 1992 that the Juragua nuclear plant was unsafe and similar Soviet-style plants in Eastern Europe have already suffered accidents. Four such plants were shut down by the German government after reunification of that country

Mr. President, we cannot allow this type of threat to the security of the United States to be present just a few hundred miles from our shores, especially in the hands of a totalitarian tyrant like Fidel Castro who has no respect for the dignity of human life. We urge you to pressure the government of Russia to stop helping the Castro regime finish construction of this nuclear plant.

Sincerely,

Ileana Ros-Lehtinen
Ileana Ros-Lehtinen
Member of Congress

Lincoln Diaz-Balart
Member of Congress

Newt Gingrich
Speaker of the House

Ben Gilman
Ben Gilman
Member of Congress

Dan Burton
Dan Burton
Member of Congress

Robert Menendez
Member of Congress

Robert Torricelli
Member of Congress

Chris Smith
Christopher Smith
Member of Congress

Bill C.W. Young, M.C.

Sam Johnson, M.C.

Dan Miller, M.C.

Toby Roth, M.C.

Bill Martini

William J. Martini, M.C.

Mark Foley

Mark Adam Foley, M.C.

Carrie P. Meek

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Eliot L. Engel

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Gerald B.H. Solomon, M.C.

Porter J. Goss, M.C.

Cass Ballenger

Cass Ballenger, M.C.

Peter T. King, M.C.

Dick Armey

Richard K Armey, M.C.

Dana Rohrabacher

Dana Rohrabacher, M.C.

Lamar Smith

Lamar Smith, M.C.

"Duke" Cunningham

Randy "Duke" Cunningham, M.C.

Duncan Hunter, M.C.

Chris Cox

Christopher Cox, M.C.

Charles T. Canady, M.C.

Bill McCollum

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Jim Lightfoot

Jim Lightfoot, M.C.

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Sue Kelly

Sue W. Kelly, M.C.

Sonny Bono

Sonny Bono, M.C.

Cosigners Of Cuba Juragua Nuclear Plant Letter To President Clinton

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Robert Andrews
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Mark Sanford
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Lamar Smith
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Robert Torricelli
Enid Waldholtz
Zach Wamp
J.C. Watts
Curt Weldon
Dave Weldon
Frank Wolf
Ed Whitfield
Bill Young
William H Zeliff
Dick Zimmer

THE WHITE HOUSE
WASHINGTON

July 24, 1995

Dear Representative Ros-Lehtinen:

Thank you for your letter expressing concern about the potential safety hazards posed by the possible completion of the Juragua nuclear power plant.

The U.S. Government has monitored the Juragua project closely since construction began in 1983. We have repeatedly stated our objections to completion of the facility. I remain concerned about the Cuban Government's failure to commit to comprehensive safeguards; it has signed but not yet ratified the Treaty of Tlatelolco, and it has not negotiated a full-scope safeguards agreement with the IAEA. We also have serious questions about the quality of the plant's construction -- underscored by testimony by emigres with firsthand knowledge -- and Cuba's ability to operate it safely. Possible deterioration of the facility since construction was abruptly suspended in 1992 has compounded these problems.

We have made our concerns known to Moscow on many occasions. Although the former Soviet Union in 1986 pledged that the facility would meet international safety standards and include proper containment, we have continued to press Moscow to address our concerns about the facility. As recently as June 22, we urged Russia not to move ahead with the project. We have also voiced our concerns to the governments of countries that might supply the equipment needed to complete the reactor.

I assure you that we will continue to give this issue the high priority it warrants.

Sincerely,

Bill Clinton

The Honorable Ileana Ros-Lehtinen
House of Representatives
Washington, D.C. 20515

TESTIMONY FOR THE RECORD

Edward E. Purvis III

I am a Consultant in nuclear safety and nuclear waste management. My primary activities concern Soviet designed nuclear facilities. While at the US Department of Energy I headed the US Department of Energy's Analysis Team from 1986 to 1989. This DOE Team assembled design information on Soviet designed nuclear facilities and did extensive analyses of safety related design features. Since retiring from DOE in 1990 I have continued to assemble and assess information on Soviet designed nuclear facilities. I authored, working with the Ukrainian Academy of Sciences, the second official report on the Chernobyl 4 Accident. The Ukrainian Academy of Sciences published this report in April 1995 and provided detailed information gathered since the publication, in August 1986, of the first official report on this accident. I am also President of the Center for International Nuclear and Radiation Safety, a non profit organization concerned with nuclear and radiation safety.

This provides information about the Soviet designed nuclear power units that are again planned for construction in Cuba.

OVERVIEW

The two nuclear unit in Cuba are called VVER 440 Model V318s. These are a modification of the earlier VVER 440 model V213. All VVER 440s have six primary coolant loops, each containing a steam generator, a primary coolant pump, and an isolation valve. Earlier models used an "Accident Localization System" rather than a containment vessel such as used on Western nuclear power plants. VVER 440 model V213s have a large external building to quench steam from an accident involving a pipe rupture and hold the gases.

A containment type structure increase safety. The Cuban VVER model V318s have a containment structure. This structure is built of reinforced concrete, which is not as strong as prestressed concrete containments used on western reactors and 1000 MWe Soviet designed VVERs.

Figure 1 shows the overall layout of the VVER-440 model V-318 units under construction at Juragua, near Cienfuegos, in Cuba. These differ from VVER-440 model V-213s in Russia and Eastern Europe.

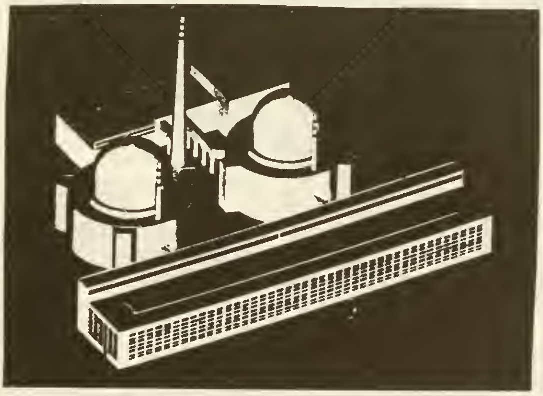

Figure 1 Overall View

Two reactor units are located inside two cylindrical buildings. An elevation view of the VVER 440 model V318 buildings is shown in the overall view of the reactor site (Figure 2).

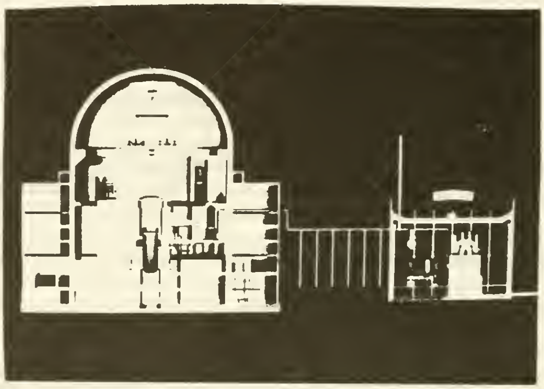

Figure 2 Elevation View of Cuban VVER Buildings

The primary coolant system is located in a steel lined, cylindrical, reinforced concrete containment structure. The containment includes a lower region consisting of the reactor shaft compartment, steam-generator compartment, and a compartment that contains the primary coolant pumps, isolation valves, and electrical equipment (Figure 3).

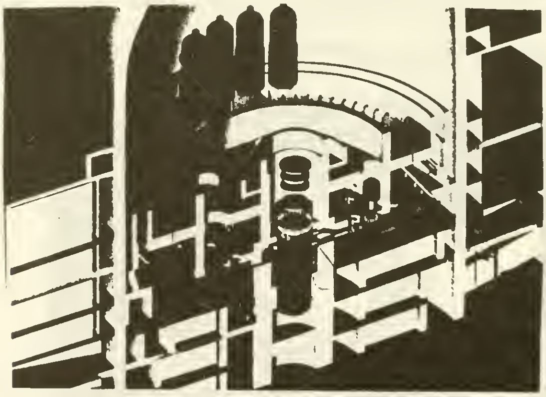

Figure 3 Cuban VVER Containment Building

The containment has annular bubbler/condenser pools for steam pressure suppression between the lower region and the (upper dome) region above the refueling level operating floor around the edge of the containment building, Figure 4). In the VVER 440 model V318, the containment volume above the operating floor functions as the air trap as does the bubbler/condenser tower in the VVER 440 model V213. Since in this design the entire primary coolant system, including the top of reactor vessel, is located within the sealed upper containment volume, this system can be regarded as having contaiment.

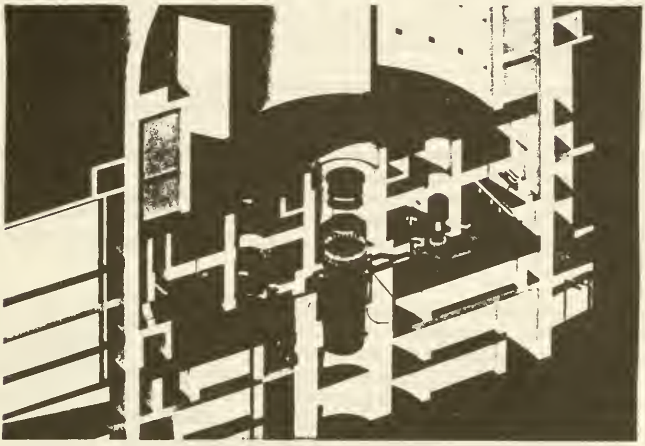

Figure 4 View of Containment and Equipment Buildings
The yellow structure allong the walls of the containment building are the annular bubbler condenser pools.

As in the VVER 440 model V213 and VVER 1000 design, the bottom level of the VVER 440 model V318 containment is above grade level and does not extend down to the foundation basemat. Unsealed regions beneath the containment structure house auxiliary and safety systems as in VVER 440 model V213s, plus a rail line for transfer of fresh and spent fuel. There is a transport hatch in the containment floor allowing for the passage of fresh fuel transfer baskets or spent fuel shipping casks.

The annular auxiliary building houses ventilation, electrical, safety, and auxiliary equipment, plus tanks for water storage. The control room is located at the 14.31 meter (46.75 foot) level and the backup control room at the 19.65 meter (64.52 foot) level. These elevations lie well above the water levels that are predicted to result from tidal waves. Three emergency diesel generators providing emergency alternating current power to safety systems are also contained inside the annular auxiliary building below the containment level.

The turbine generator building houses four 210 megawatt electric turbine generators. The turbine generators are in a separate adjacent building (Figure 1). To decrease the length of cooling water piping, the turbine building is located closer to the ocean than the reactor buildings. The grade elevation at the turbine building is lower that at the two reactor buildings.

Steam and feedwater piping between each reactor building and the turbine building is in an elevated corridor located at the 10.4 meter (34.1 foot) elevation as shown in Figure 2.

A single radwaste building serves both units. The radwaste building design differs from that of the VVER-440 models V-230 and V-213. In addition to work areas, water treatment facilities, and areas for liquid and solid waste storage, the radwaste building also contains areas for the storage of both fresh and spent fuel.

Each reactor building contains a ventilation stack mounted on the side of the annular auxiliary and control equipment building nearest to the turbine building (Figure 1). Each units reactor building is joined to the radwaste building by an elevated ventilation duct.

It is planned that bituminization will be used to immobilize radioactive wastes. A building for storage of bituminized wastes is located adjacent to the radwaste building.

A personnel building for staff and visitors to change clothes before entering the reactor or radwaste building is located on the other side of the radwaste building from the waste storage building.

A pumping station building, housing all the pumps that provide service water for the two units, is adjacent to the water inlet channel. The grade level at the pumping station is below that at the turbine building and the reactor buildings. The inlet channel leading from the Caribbean Sea has a length of about 900 meters (2,950 feet), a width of 35 meters (115 feet), and a depth of 7.5 meters (25 feet). The portion of the channel immediately surrounding the water intakes to the pumps has a greater depth than the nearby sea level and is surrounded by a dam.

Construction was stopped in 1993. Approximately 30 million dollars were allocated to preparing the buildings and structures, material, and system for storage. No information is available to assess the current condition of these items. Cuba now plans to restart construction of these nuclear power units. No detailed information is available as to the current financial arrangements for completing these units, however the conditions previously established by Russia had been such as to render completion impossible. It appears that more favorable conditions have been negotiated, additional financing sources have been arranged, or a combination. The plans for completion are known to envision the use of a western style instrumentation and control system, such as that produced by the German firm Siemens. It is understood that Siemens has a licensing arrangement with a Russian organization, so the instrumentation and control system may either be obtained from Germany, Russia, or other supplier(s) providing comparable Western equipment.

A recent visit to the site by NBC News provided good insight into the current situation. It is estimated that over 90 % of the civil structural work on unit one has been completed. Most of the components and equipment for the primary coolant system for the first unit, including the reactor pressure vessel, primary coolant pumps, and steam generators have been delivered. Less than half of the civil structural work for the second unit has been completed. Only the parts of the primary piping are believed to have been delivered for the second unit.

There were plans to construct units of this same design at Komsomolsk-Na-Amure in Russia. This project has been canceled.

CONTAINMENT

The Cuban VVER 440 model V 318 units near Cienfuegos have a steel-lined, cylindrical, reinforced concrete structure. The system to quench the stem released by a pipe break is in some ways similar to ice-condenser type containment. The ice heat sink is replaced by two levels of water trays (bubbler/condenser trays) for steam condensation. Figure 4 shows this bubbler/condenser containment concept. The containment volume is divided into two major parts by the operating floor and water seal formed by the bubbler/condenser trays. The upper portion is the operating deck (dome region) where fuel handling operations are performed. The lower region contains numerous steel-lined compartments that house the reactor pressure vessel, the steam generators, the primary coolant system pumps, motors, loop isolation valves, and piping. The compartments are modifications of the VVER-440 model V-213 design to fit into the cylindrical containment building. The compartment walls are nominally about 1 meter (3.9 inches) thick. The basemat is 3.0 meters (9.8 feet) thick.

The reinforced concrete dome and cylindrical containment shell are 1.5 meter (4.9 feet) thick. The steel lining is about 0.6 centimeters (0.24 inch) thick. The design leak rate is one volume percent per day at the design over pressure of 0.15 megapascals (22 pounds per square inch gauge) in the lower region and 0.05 megapascals (7.4 pounds per square inch gauge) in the upper region (dome). In a Soviet analyses, the total free volume inside the containment was assumed to be about 62,400 cubic meters (2.20x10^6 cubic feet), of which about 30 percent was in the lower compartments and 70 percent is in the upper (dome) region. The containment is a closed system; there are no vent paths to the atmosphere as in the VVER-440 model V-230 design. The containment is protected against overpressure during a large-break loss-of-coolant accident by the bubbler/condenser system, plus operation of both active and passive spray systems in the lower region .The multi-level bubbler/condenser tanks were assumed in Soviet analyses to contain a total of 780 cubic meters (27,500 cubic feet) of water. Boric acid, sodium thiosulfate and potassium hydroxide are dissolved in this water. Details are shown in Figure 6.

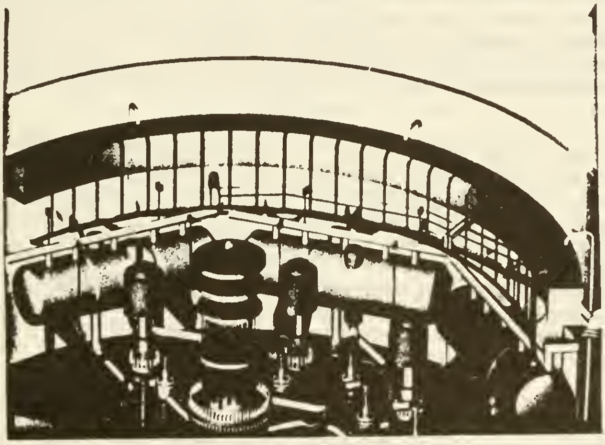

Figure 6 View of bubbler/condenser system and reactor system with interior concrete removed

The bubbler/condenser units limit the pressure rise in the initial phase of a loss-of-coolant accident. Each bubbler/condenser tank contains 2.5 meters (98.5 inches) of water in which are submerged a large number of vertical bubbler tubes 4 meters (157.6 inches long). The walls of the compartments housing the bubbler/condenser tanks and this water layer separate the operating area from the compartments that house the reactor equipment. Separate ventilation systems are provided to both areas.

The functioning of the bubbler/condenser vapor suppression system is in two phases. During the first phase the coolant is escaping from the system, raising the pressure in the reactor system compartments. During the second phase, the pressure is reduced by steam condensation to create a partial vacuum in the reactor compartments.

The coolant flashing to steam during a loss-of-coolant accident in the reactor compartments flows through the shaft and pipes to the bubbler/condenser tubes. When the pressure rise exceeds the head of water initially filling the bubbler tubes, the steam/air mixture is forced downward through the bubbler/condenser tubes. Steam is condensed as the steam/air mixture exits the bottom of the tubes, and bubbles up through the surrounding water pool. The air and uncondensed gases passing through the water go through the orifice into the

Each reactor building contains a ventilation stack mounted on the side of the annular auxiliary and control equipment building nearest to the turbine building (Figure 1). Each units reactor building is joined to the radwaste building by an elevated ventilation duct.

It is planned that bituminization will be used to immobilize radioactive wastes. A building for storage of bituminized wastes is located adjacent to the radwaste building.

A personnel building for staff and visitors to change clothes before entering the reactor or radwaste building is located on the other side of the radwaste building from the waste storage building.

A pumping station building, housing all the pumps that provide service water for the two units, is adjacent to the water inlet channel. The grade level at the pumping station is below that at the turbine building and the reactor buildings. The inlet channel leading from the Caribbean Sea has a length of about 900 meters (2,950 feet), a width of 35 meters (115 feet), and a depth of 7.5 meters (25 feet). The portion of the channel immediately surrounding the water intakes to the pumps has a greater depth than the nearby sea level and is surrounded by a dam.

Construction was stopped in 1993. Approximately 30 million dollars were allocated to preparing the buildings and structures, material, and system for storage. No information is available to assess the current condition of these items. Cuba now plans to restart construction of these nuclear power units. No detailed information is available as to the current financial arrangements for completing these units, however the conditions previously established by Russia had been such as to render completion impossible. It appears that more favorable conditions have been negotiated, additional financing sources have been arranged, or a combination. The plans for completion are known to envision the use of a western style instrumentation and control system, such as that produced by the German firm Siemens. It is understood that Siemens has a licensing arrangement with a Russian organization, so the instrumentation and control system may either be obtained from Germany, Russia, or other supplier(s) providing comparable Western equipment.

A recent visit to the site by NBC News provided good insight into the current situation. It is estimated that over 90 % of the civil structural work on unit one has been completed. Most of the components and equipment for the primary coolant system for the first unit, including the reactor pressure vessel, primary coolant pumps, and steam generators have been delivered. Less than half of the civil structural work for the second unit has been completed. Only the parts of the primary piping are believed to have been delivered for the second unit.

There were plans to construct units of this same design at Komsomolsk-Na-Amure in Russia. This project has been canceled.

CONTAINMENT

The Cuban VVER 440 model V318 units near Cienfuegos have a steel-lined, cylindrical, reinforced concrete structure. The system to quench the stem released by a pipe break is in some ways similar to ice-condenser type containment. The ice heat sink is replaced by two levels of water trays (bubbler/condenser trays) for steam condensation. Figure 4 shows this bubbler/condenser containment concept. The containment volume is divided into two major parts by the operating floor and water seal formed by the bubbler/condenser trays. The upper portion is the operating deck (dome region) where fuel handling operations are performed. The lower region contains numerous steel-lined compartments that house the reactor pressure vessel, the steam generators, the primary coolant system pumps, motors, loop isolation valves, and piping. The compartments are modifications of the VVER-440 model V-213 design to fit into the cylindrical containment building. The compartment walls are nominally about 1 meter (3.9 inches) thick. The basemat is 3.0 meters (9.8 feet) thick.

operating area volume. When the pressure in the reactor compartment is no longer sufficient to force the steam through the bubbler/condenser unit the first phase of accident mitigation is completed. The temperature of the water in the bubbler/condenser tanks is expected to rise to a maximum of 85 to 90 degrees Centigrade (185 to 194 degrees Fahrenheit). Both active and passive spray systems are provided to reduce pressure in the reactor compartments. Passive sprinkler devices facilitate a rapid pressure reduction inside the reactor compartment. These are open tanks filled with water containing boric acid that contain a siphon pipe that runs from near the bottom of the tank to the spray headers located in the reactor compartment.

The headers are equipped with spray nozzles. The sprinkler tanks were assumed in the Russian analyses to hold 200 cubic meters (706.2 cubic feet) of borated water. The steam generator compartment is connected to the plenum above these tanks by pipes and the shaft. The VVER-440 model V318 passive sprays are designed to operate for unidirectional flow from primary coolant system breaks of a size equivalent to a 20 centimeter (7.9 inches) diameter circular hole or larger, without flow constrictors. The objective is to limit operation of this passive spray system to large break loss of coolant accidents. A pressure difference equivalent to 70 centimeters (27.6 inches) of water is required to initiate flow from the tanks to the spray headers. The difference in the pressure above the water and the pressure inside the header forces the borated water solution through the siphon tube, the header, and the atomizer. Although the sprinklers are not expected to be adequate to condense the steam in the initial phase of a large loss-of-coolant accident, the designers expect that toward the end of coolant discharge (after about 25 to 30 seconds) the passive system will be capable of condensing steam as it is formed. It is expected that the pressure will then start to fall in the reactor enclosures. The passive sprinklers are expected to continue to operate until all of the borated water solution available [assumed to be 200 cubic meters (7060 cubic feet) in Soviet analysis] is used. Cuban literature indicates that once activated, operation of the passive sprays can continue without interruption for 5 minutes.

The passive sprinkler tanks are in an annular compartment between the steam generator compartment and the operating deck. This level of sealed compartments does not exist in the VVER-440 model V-230 and V-213 accident localization systems. Adding this extra compartment necessitated raising the operating deck elevation.

The active sprinkler system is designed to begin injecting droplets about one minute after the loss-of-coolant accident occurs. The pump draws coolant from either the borated water storage tank or the sump through a heat exchanger, and pumps it to the active spray headers into the reactor enclosures. Calculations predict that about 160 seconds after the loss-of-coolant accident begins, a slight vacuum will be created in the reactor enclosures. The air that was displaced into the operating volume will be kept there by the water barrier in the bubbler/condenser tanks created when the pressure above the operating deck is greater than the pressure in the reactor compartments. Only when the pressure differential between the operating volume and reactor enclosures is sufficient to drive water up into the bubbler tubes and lower the water level to below the ends of the tubes, will air flow back into the reactor compartments. The Soviet (and current Russian) design basis requires a pressure differential of 0.038 megapascals (5.5 pounds per square inch), corresponding to a water head of 4 meters (13 feet), for this back flow to occur.

The bubbler condenser approach discussed above is covered by United States Patent Number 4,362,693 dated December 7, 1982.

The overall containment building volumes of the VVER 440 model V318 is comparable to those in VVER 1000 model V320s While the prestressed containment building used in VVER 1000s is designed for a pressure of 0.41 megapascal (60 pounds per square inch gauge) and to accommodate a temperature of 150 degrees Centigrade (300 degrees Fahrenheit), the VVER 440 model V318 accident localization system is designed to accommodate a maximum pressure of about 0.15 megapascal (22 pounds per square inch) in the equipment compartments and about 0.05 Megapascal (7 pounds per square inch) in the upper volume. The

VVER 440 model V318 containment relies upon steam condensation to achieve subatmospheric conditions inside the compartments and reduce outward leakage of radionuclides. As with the VVER 440 model V213, this reflects the concerns about the capability of various VVER 440 systems, components and electrical equipment that were not designed to continue to function under conditions of sustained elevated pressure and humidity. The sealed accident localization compartments are constructed on top of unsealed compartments in the VVER 440 models V213 and V318.

VVER 440 model V318s incorporate a provision to release steam into the containment that would otherwise be vented into the atmosphere through the atmospheric dump valves. This serves to reduce the release of radioactive steam and fission products that would accompany specific primary-to-secondary loss-of-coolant accidents.

The containment and reactor building of the VVER-440 model V-318s being built in Cuba has a number of unique design features reflecting the conditions of the Cuban climate and location. The design bases include the effects of aircraft impact, external explosion blast wave loading, earthquakes, hurricanes, tornadoes, tidal waves, and the high humidity temperature of the tropical environment.

The containment design basis is to withstand the impact of a 20 tonne (44,000 pound) aircraft moving at a speed of 200 meters per second (660 feet per second or 450 miles per hour). The outside walls of the annular auxiliary equipment and control building are not designed to withstand the effects of an aircraft crash, except for the 55 degree sector above 10.5 meters (34.4 feet) elevation in which the steam and feedwater pipes are routed to the turbine building. The designers claim that because the three sets of the emergency core cooling system components are located in three distinct sectors of the annular auxiliary equipment and control building, an aircraft crash cannot simultaneously destroy more than two of the three sets of these components.

Those portions of the radwaste building used for storage of fresh and spent fuel, storage of liquid and solid wastes, as well as waste bituminization are also designed to survive the reference aircraft impact. Soviet literature states that the distance between individual pumps inside the pumping station will preclude the loss of all of the pumps, in the event of an aircraft crash into the pumping station.

The containment is also designed to withstand the effects of an external blast wave having an overpressure of 0.03megapascal (4.35 pounds per square inch) at the leading edge and a period of 33 seconds. This design basis applies to those portions of the radwaste building discussed above in connection with aircraft impact. The containment design basis is to withstand wind forces of 0.3 megapascal (43.5 pounds per square inch) resulting from a hurricane or tornado.

The design basis of the containment and other buildings and structures housing equipment required to safely shut down and maintain the reactor in a safe shutdown condition is an earthquake of intensity eight on the MSK-64 scale. Other structures on the site related to personnel safety and required for electric power generation are designed for an intensity six earthquake.

The Cuban units design basis includes tidal waves having crests 10 meters (33 feet) above the nominal water level. This corresponds to a maximum wave height of 4 meters (13 feet) above the ground elevation. The Cuban units design basis is also reported to include provisions for the humid tropical climate and the potential for corrosion resulting from chlorides present in the Caribbean atmosphere and seawater coolant. Filters are used to remove chlorides and sulfides from air. Steel structure, reinforcement incorporated in concrete, and steel liners attached to concrete are covered with protective aluminum paint or a protective organosilica coating. Service water piping is covered with aluminum paint or organosilica coating. Soviet literature states that the structures have been designed to prevent the accumulation of corrosive gases, liquids or dust.

The key area where such cooperation is required is in working with Cuba to develop a capability to perform technically sound safety analyses to Western standards and to develop the very important infrastructure required to have a strong and nuclear regulatory organization. This will require interactions with nearby countries with strong nuclear regulatory bodies.

FINANCING

Cuba is currently spending a lot of money to import oil to generate electricity. Due to the advanced state of at least one unit and the sunk cost, the cost of completing the unit is relatively small compared to the savings in hard currency currently being used to pay for oil. The savings in the cost of oil and the relatively short repayment time is probably the rational being used in the financing area.

ACKNOWLEDGMENT

Some of the information in this submittal was taken from DOE/ NE-0084, an overall design description of Soviet designed VVERs, the "Red Book", prepared by the DOE's Analysis Team and issued in 1988. Much of the information was drawn from unpublished, copyrighted information compiled since 1992 that updates and expands upon the information in this DOE publication. The contribution of the DOE reference to the information provided herein is acknowledged.

FACTS ABOUT CUBA'S NUCLEAR POWER PLANT AT JURAGUA, CIENFUEGOS

First, we should expand on the Cuban electrical generating system. Cuba's electricity is generated by fossil-fuel dependent plants located throughout the island. The most important by order of modernness and efficiency are:

1). The "Antonio Guiteras" plant in Matanzas. Built a few years ago under French supervision and technology, it is the most efficient plant in the country, generating 30% of all the power. The city of Havana is their most important consumer.

2). The Santa Cruz del Norte thermoelectric plant, (20 miles east of Havana) built with Soviet technology and supervision.

3). The Santiago de Cuba plant. (500 miles east of Havana).

4). The thermoelectric plant near the notorious port of Mariel, twenty miles west of Havana.

5). The Nuevitas plant, in the Northern coast of Camaguey.

6). The almost centenarian plant of Tallapiedras, in Havana.

These plants operate in network, supplying energy according to fuel availability, economic-based decisions and stoppages for repairs and maintenance.

Obviously, these plants are capable of supplying enough power to satisfy the demand. So, why do not they ? It is common knowledge, It is due to short fuel supply. Why is this ? It is also known, It is because they [the Cuban government] do not have money to buy it due to the country's deep economic crisis; but that is another story.

Then, in order to ease their dependency on oil, and "modernize' the country with atomic technology is when Castro decides on building the NUCLEAR PLANT IN JURAGUA. At least, this was the excuse given.

Should a poor and underdeveloped country as Cuba invest on such an ambitious project ? Obviously not. What the country really needs is democracy, real democracy, to provide economic freedom to get rid of all the maladies compounded by 36 years of dictatorship and communism.

In order to provide and control the "Cuba Nuclear development", Castro crated Cuba's Atomic Energy Commission (CEAC), presided by: his personal friend and corrupt Jose Ramon Fernandez (alias el Gallego Fernandez); Rosa Elena Simeon, president of the Science Academy; and his "illustrious son" Fidel Castro Diaz-Balart.

At the same time "Fidelito" Castro Diaz-Balart was the Executive Secretary for nuclear affairs until he was fired by his father.

The arguments about fuel shortness and how nuclear energy would bring prosperity and development to Cuba, were the same used to justify before the Cuban people and the international community, the Cuban nuclear program, which is ambitious and is not limited to the Juragua nuclear plant. If each energy-poor country decides to generate nuclear power through atomic power plants, then without any reasonable doubt, the world is doomed.

Secondly, nuclear energy is itself does not provide economic development. How can anyone base economic growth to having nuclear technology ? Wow could a country undergoing a deep financial crisis, (caused by their own archaic, sociopolitical system and the stubbornness of one ruler's aberration to cling on a political system proven to fail), afford access to nuclear power supervised by a country (Russia) which has shown the world how ancient and unsafe their technology is ?

What Fidel Castro is not telling the Cuban people is that such nuclear installation needs nuclear fuel (Uranium) and that is much more expensive than oil. If he does not have money to buy oil, would he have it to buy uranium ? Or, could it be that he already holds some uranium from donations by the old Soviet empire or acquired through state--supervised contraband ?

Cuba does not need a nuclear power plant. What it needs is democracy and open trade as a requirement to surpass its deep financial crisis.

Suddenly, construction of the Juragua plant is supposed to resume after a three-years period of inactivity, with the suspicious and dubious finding of European investors. (Surely backed by Castro's promise of investment opportunities). Having a nuclear plant in Cuba will also facilitate construction of two more plants already planned for Holguin and Pinar del Rio, and further develop the Center for Nuclear Investigations near San Jose de la Lajas in Havana, on a section known as Pedro Pi. This enormous research center is kept under tight security and also have a nuclear reactor to perform other side projects such as The Isotopes Center, the Gamma-Radiation Plant, the nuclear waste treatment plant and the Radiation, Atmospheric Gas and Wind Velocity Measurements Center.

I personally believe this is the right moment for the international community to demand answers from the Cuban dictator to questions on what he pretends to research, and what nuclear technology he wants to develop.

THE GREATEST CONCERNS ABOUT THE NUCLEAR POWER PLANT OF JURAGUA ARE THE FOLLOWING:

Judging from a structural standpoint, the Central nuclear power plant of Juragua should have been built in a specialized manner, but then, personnel offices were open throughout the island hiring mostly young inexperienced people without any technical skills, and training them "in-a-hurry". This included welders whose job was of the utmost importance due the number of special solderings needed for the huge frameworks.

Deficient quality control of the solderings due to lack of metallorgraphic tests. Control points were routinely lowered to simple visual or physical tests. The few X-rays taken, detected flows which were never corrected. It should also be noted that all construction works in Cuba since 1959 have been plagued with quality problems mainly because of the required pressing "commitments" to Fidel Castro which are always timely fulfilled but lacking in quality.

In 1993, a special committee of the International Organization of Atomic Energy visited Cuba with the purpose of giving the safety seal of approval to the nuclear power plant. At that time, the committee was deceived by the Cuban government in the sense that the seismographic studies presented were made on the eve of the inspection and not ten years before, when they had been hidden and forgotten. This clearly shows the lack of responsibility and seriousness on the part or the Cuban government.

If the seismographic studies performed by the Institute of Geodesy and Astronomy (IGA) were measured and processed at a fast pace after the power plant was already in place, shouldn't it be asked, which data was used to calculate the structural earthquake resistance ?

Poor maintenance of the buildings after abandonment of more than three years, considering that subject plant is located at a highly corrosive area by its proximity to the sea shore.

The nuclear power plant is water--cooled, for which process sea water is used, making it prone to an irreversible ecological disaster. The Cuban southern coast is rich in coral and the Caribbean Sea is particular important to navigation as it includes all maritime transport passing through the Panama Canal.

This is a Russian made and supervised project, proven to be OUTDATED AND UNSAFE TECHNOLOGY, which combined with the recent exodus of their best nuclear technicians from Cuba, (leaving behind only the inexperienced, poorly-trained technicians in old

Russian plants) makes the most skeptic individual worry about the dangers involved in the operation of such nuclear power plant.

The Caribbean is a geographical are with no mountain rangers. This may allow a radiation leak to reach just is a few hours, Dominican Republica, Jamaica, Puerto Rico, Central America and southern UNITED STATES. (Maximized even more if in hurricane season).

These arguments should be more than enough to excite the necessary protests against completion of the nuclear plant of Juragua, as well as the other two already planned for Holguin and Pinar del Rio and paralyzing Cuba's ambitious nuclear program, which may ENDANGER LIFE IN THE UNITED STATES IN THE EVENT OF A NUCLEAR DISASTER.

Even without any occurrence of a nuclear accident, DOES IT HAVE ANY SENSE TO LIVE IN THE UNITED STATES FEARING A RADIOACTIVE GHOST ? DOES THE U.S.A. PEOPLE DESERVE TO BE VICTIMIZED WITH SUCH IRRATIONAL IDEA AS BUILDING A NUCLEAR PLANT IN CUBA ?

To remain silent or without exerting pressure to avoid a foreseen catastrophe will make some governments silent partners of all ecological damage and to humanity in general, which such a disaster would bring.

From the conference given in San Juan, Puerto Rico, July 11th, 1995 by Seriozha Sergio Gonzalez Aguilera, Engineer.
Eng. Gonzalez worked in the construction of the nuclear power plant of Juargua, Cienfuegos, Republic of Cuba.

Guayama, Puerto Rico August 16, 1995.

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Translation - Spanish

Miami, July 1, 1995

Mrs. Anita Winsor
Personnel Associate
Subcommittee on Western Hemisphere

Dear Mrs. Winsor:

I have the pleasure of answering your letter of June 20. I appreciate your invitation to express my opinions regarding the completion and putting into operation of the Juragua Nuclear Plant in Cuba. I feel that, given the seriousness of the matter, it is an obligation to make known the technical opinion of all of us professionals who in one way or another have participated in the analysis of this project.

For more than 20 years I have been the General Designer on the State Economic Collaboration Committee. During this time I have worked on the development of projects and investments in Cuba by the former USSR, such as the Nuevitas Fertilizer Plant and textile factories such as Ariguanabo, Hilandería Balance and Celia Sánchez (the largest ones in Cuba). I have had to discuss the projects in Moscow and Leningrad and then supervise construction in Cuba.

As I indicated in the letter to Mr. Lincoln Diaz Balart, my participation in the Juragua Nuclear Plant centered basically around the review of the specialty of architecture, in the technical project. With the collaboration of other technicians we wrote a protocol of observations that should figure among the work documents.

My long personal experience allows me to make, with total responsibility, the following observations about Cuban industrial construction:

a) Rarely is it done with the proper quality and through certifications, systematic technical control of the construction materials, their use and proportions.

a) It is customary that there not be laboratory tests of the cast iron, or that they be done without the proper intervals, and they should also be guaranteed through the corresponding certifications. It was common for their omission to be justified by arguing different reasons. In many cases it was necessary for the designer to find himself forced to prove the resistance of the structure through special ultrasound or X-ray tests, with situations arising in which the designer had to reject an element, destroy it or reinforce it.

c) On many occasions, without the designer's authorization, the standards for welding and insulation materials, leveling and building sequence were modified.

d) The frequent failure to comply with these minimum requirements led to construction disasters in the execution of typical cisterns, channels, prefabricated buildings, elevated or buried tanks, foundations, etc. Very common defects are cracks, poorly finished construction joints, leaks of all types (on decks, walls, containment walls, etc.) due to the lack of care in finishing. These defects are serious in many factories, but would be terrible in the cases of the Juragua Nuclear Plant.

e) Part of these problems have had their origin in causes such as political leaders' disdain for technical opinions; beginning works without the project having been completed; interrupting them, sometimes for months, in order to carry out others that a leader considered more urgent; absurd work schedules of 16 or more hours a day that produced tiredness among the workers, from which they could not recover, and reduced quality vertically; modification of the logical building schedule in order to adjust it to revolutionary celebrations, etc.

f) The above points lead us to opine that the hidden works, foundations, wiring, pipes, and their connections, with their corresponding water tightness tests must be verified and checked. It should be kept in mind that to the possible construction problems must be added those of a work interrupted for years.

We do not have truly valid reasons for thinking that the Juragua Nuclear Plant is free of these and other problems. We believe that the "Work Books," which are like diaries of the construction, should be reviewed and checked and should have been taken by both parties, the USSR and Cuba, the two being responsible in what was written and executed.

Supposing that all of the above had positive results, our concern is then the start-up and operation of the plant. We know that the personnel selected for it was prepared in the former Soviet Union and other countries of the Socialist area, more than some 20 years ago. This personnel is in large part located in different parts of the world, working in other spheres of their specialty, or in exile. Therefore, the training of new plant specialists and workers should already have been begun. It must be ensured that the selection of that personnel has been made with a technical criterion and not according to *revolutionary integration* and loyalty to the Communist Party. No longer are there Cuban students in Russia and I cannot imagine in what part of the world they are being trained in the study and operation of an antiquated technology. I fear that this new personnel without an in-depth training will carry out actions whose consequences we cannot imagine.

With respect to the storage and degradation of the radioactive material, we have scant information on the installations that it is supposed were designed in different places of the Island. It is logical to suppose that these installations will suffer from the same defects noted above. Studies conduced by the National Oceanic and Atmospheric Administration (NOAA) show how in the case of an accident or serious malfunction the entire Caribbean zone, and a good part of U.S. territory, especially the peninsula of Florida and part of the states with a coast on the Gulf of Mexico, would be affected. Nor can we ignore possible future uses of plutonium.

I believe that all the above is sufficient in order to reassert my opinion that the pressures should be exercised to prevent the completion and putting into operation of the Nuclear Plant of Juragua.

Very sincerely,

Beatriz Masó, Ph.D.
Architect

Translated by
Deanna Hammond
CRS - Language Services
October 4, 1995

Experts To Finalize Cuban Nuclear Plant Plans in Russia

PY1307010295 Rio de Janeiro JORNAL DO BRASIL in Portuguese 11 Jul 95 p 6

[From the "JB Report" column by Dora Kramer]

[FBIS Translated Text] Experts from the MPE [expansion unknown] group of Rio de Janeiro will depart for Moscow on 14 July to settle the last details of the Cuban nuclear power plant, the construction of which Fidel Castro wants to resume.

Paralyzed since the downfall of the Soviet Union, the nuclear plant, which is located in Cienfuegos, will be finished thanks to financing from Russia, MPE, and a consortium of British and German banks.

The cost of the construction will be $750 million, and it will supply energy to the hotels of Varadero.

FRANK GAFFNEY JR.

Cuba's nuclear power plant time bomb

Cuban dictator Fidel Castro is at it again: With at least $800 million in help from his friends in Moscow and Europe, he hopes at last to bring online a troubled nuclear reactor 180 miles off the U.S. coast. It has been clear for several years that, should he succeed in doing so, it is just a matter of time before this reactor melts down with catastrophic Chernobyl-style consequences for much of the United States. Today, concerned Members of Congress led by Reps. Robert Menendez, New Jersey Democrat, and Ileana Ros-Lehtinen, Florida Republican, will offer the first of possibly numerous legislative initiatives aimed at blocking efforts to complete the Juragua reactor complex — and at penalizing those who propose to assist Havana in doing so.

Among the most lethal detritus left behind by the collapsed Soviet empire are a string of poorly designed, ill-constructed and/or incompetently operated nuclear reactors that pose a risk of human and environmental calamity. Most of these are within the former Soviet Union itself and Eastern Europe and have been subject to chronic, unscheduled shutdowns for safety reasons. Many are regarded as nothing less than ticking time-bombs. Indeed, the German government was so concerned about the four VVER 440 reactors it inherited from East Germany that it shut them down within days of reunification.

The two partially completed VVER 440 reactors near Cienfuegos, Cuba, are in a class by themselves, however. Experts, including defectors previously involved in what passed for a "quality control" program at the construction site, have identified the following, fatal defects:

- Sixty percent of the Soviet-supplied materials used in these reactors is defective. Soviet advisers reportedly told Cuban officials they could not guarantee that valves installed in the first reactor's emergency cooling system would function under certain conditions. Worse yet, much of the reactor's equipment was left exposed to the elements and sea air for as long as 18 months. In tropical areas, such machinery must be stored in climate-controlled facilities to avoid serious corrosion and other damage.
- The first reactor's dome would not be able to contain overpressures associated with meltdown conditions. The upper portion of the containment dome has been designed to withstand pressures of seven pounds per square inch —vs. some 50 pounds per square inch required of U.S. reactors.
- As many as 15 percent of the 5,000 welds joining pipes used in the reactors' auxiliary plumbing system, containment dome and spent fuel cooling system are known to be flawed. According to Vladimir Cervera, the senior engineer responsible for overseeing quality control at the Juragua reactor, X-rays showed welded pipe joints weakened by air pockets, bad soldering and heat damage.

Bear in mind that, if a single weld in a U.S. reactor were suspected of being defective, the Nuclear Regulatory Commission would suspend its operations. What is more, Cuban intelligence services are reported to have destroyed x-ray imagery and other documentation concerning safety violations, making corrective action problematic.

Taken together, these and other defects make it impossible to create safe nuclear power plants out of the partially constructed Juragua facilities. No amount of sophisticated Western instrumentation, know-how or training will rectify fatal physical deficiencies that can, as a practical matter, only be corrected by razing the site and starting afresh.

Should one or more of these defects cause a failure of the cooling system in a Juragua reactor, there would likely be a nuclear meltdown and release of substantial quantities of radioactivity. Such fallout would not be confined to Cuba, though. Indeed, according to a National Oceanographic and Atmospheric Agency analysis:

"Based on climatological data for summer 1991 and winter '91-'92, the summer east-to-west trade winds would carry radioactive pollutants over all Florida and portions of Gulf states as far west as Texas in about four days. In winter when trade winds are weaker and less persistent, pollutants would encounter strong westerly winds that could move the pollutants toward the east, possibly as far north as Virginia and Washington, D.C., in about four days."

If ever there were a vital U.S. interest, preventing Fidel Castro from turning his rusting reactor sites at Juragua into Chernobyl qualifies. Under no circumstances should the United States be euchered into paying for this outcome — either directly or indirectly. Reps. Menendez and Ros-Lehtinen are right to seek to dock Moscow's foreign aid account by one dollar for every dollar it sends to Mr. Castro's nuclear program. They are also right to pursue every other avenue — from blocking launches of U.S. satellites on Russian rockets to deferring rescheduling Moscow's international debt to suspending American taxpayer-guarantees for energy exploitation in Russia — to bring pressure to bear on the Kremlin to stop this transaction at once.

Congress should also squarely address the malevolent behavior of companies based in allied nations. Much as Sen. Alfonse D'Amato and Rep. Peter King propose to do in legislation aimed at stopping dangerous trade with Iran, such companies should be offered a choice: You can do business with Fidel or do business in the U.S. market, but not both. The threat of import controls on European companies involved in bringing the Juragua reactors on-line would almost certainly dry up capital and technology from Europe, without which it seems unlikely the Russians could go forward.

Finally, Members of Congress need to make it unmistakably clear to the Clinton administration that its sub rosa bid to improve relations with Fidel Castro's Cuba is at an end. A despotic government that is determinedly trying to create a nuclear time-bomb — in utter disregard of the safety of its own citizens, to say nothing of the detested Americanos 180 miles to the north — is not one with whom the United States can or should do business.

Frank J. Gaffney Jr. is the director of the Center for Security Policy and a columnist for The Washington Times.

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Washington Times, October 17, 1995

Russia to renew presence in Cuba

Nuclear plant site a concern to U.S.

By Alan Philps
LONDON DAILY TELEGRAPH

MOSCOW — Russia will resume construction of a nuclear power station in Cuba, despite concerns in Washington that it could pose a safety threat.

The agreement to finish the Juragua reactor, which was mothballed in 1992 due to lack of funds, shows the Russian Atomic Energy Ministry's determination to boost its presence abroad.

The Juragua plant is situated in Cienfuegos, about 180 miles south of Key West, Fla.

Russian-American relations have been severely strained by Moscow's insistence on building a nuclear power plant in Iran, a nation that U.S. intelligence believes is working on a clandestine nuclear bomb.

Agreement on resumption of work at Juragua was reached during a visit to Cuba by Oleg Soskovets, Russian first deputy prime minister, who signed a $30 million credit agreement to enable Cuba to maintain the site until building resumes.

The deputy atomic energy minister, Yevgeny Reshetnikov, told Interfax in Havana the plant would take three or four years to build and cost $750 million.

He said that sales of electricity would help Cuba repay its $20 billion debt to the former Soviet Union.

The two countries are reported to be shopping for private companies to help finance the project. The reactor will save Cuba about 4.9 million barrels of oil annually, Interfax news agency reported.

More than 130 members of Congress have protested to President Clinton about a Russian-built power plant on Cuba, forecasting a Chernobyl-type accident. Mr. Reshetnikov said, however, this was a more modern reactor, the VVER-440, that could withstand an earthquake up to magnitude 8 on the Richter scale and a 30-foot tidal wave.

[The U.S. General Accounting Office, however, said in a 1992 report that a nuclear accident in Cuba could put as many as 120 million Americans, from Texas to Washington, at risk, depending on wind and weather conditions.

[The design of the reactor cooling system of this plant is similar to ones shut down in East Germany, days after reunification, that were deemed unsafe.

["We feel the need to stop this project," said Andrew David, a senior associate at RWR Inc. "This is not anti-Castro, it is anti-VVER-440. Regardless of how you feel about Castro, the design of this plant means it must be stopped."]

Cuba, which during the Cold War relied on subsidies from Moscow, was all but abandoned after the collapse of the Soviet Union.

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